# The Builder.

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*Aberdeen Granite.*

HERE are certain subjects, such as gold and silver or precious stones, which never fail to prove interesting to all classes of writers and readers, and the reason, we think, is obvious: they possess a universal and popular as well as a professional and scientific value, and besides, their ramifications one way and another are quite interminable.

The subject of granite belongs to this class or *genus* of article, and we are led to carry further our recent notices of granite-working by going back to granite itself. It is a favourite theme, to begin, with the poets,—particularly when they are in search of adamantine metaphors. The philosophers are always working at it in some manner; although with all their speculation they have not as yet been able to demonstrate the true theory of its cosmical genesis. As to the geologists, they are sadly puzzled about the superimposition of its rocks; and the chemists, with all their analytical researches, are still unable to explain thoroughly the true methods of its physical metamorphoses.

With regard to "the profession" in which we are more immediately interested—even in our time when granite has forced itself into every department of construction as well as decoration—we question very much if there be a subject (unless, perhaps, it might be iron), on which it would be possible to find so many inexact impressions, to use a mild phrase, or, to speak more plainly, so much absolute ignorance. Whoever shall supply in these days a sound, exhaustive, and philosophical monograph upon Granite will undoubtedly do the State, as well as the scientific world, some service.

We make no pretension, however, to perform such a laborious task, supposing the requisite qualification. All we can endeavour to do is to make some contribution towards it; and even in this we shall try to avoid the shoals and quicksands with which the subject is beset, particularly when regarded from what is called an abstract point of view. For example, the attempt to obtain some reliable insight into the natural history of granite—into its origin and physical constitution—is about the most hopeless labour in which an inquirer after physical truth could engage. If we commence with Liebnitz and his school, we quickly find ourselves in a "wilderness of speculation." If, in order to grope our way out of here, we lay hold of Werner and his disciples, we are speedily submerged in an "ocean of conjecture." No sooner do we emerge from this by the aid of Hutton and Sir Charles Lyell than we get entangled in a "labyrinth of doubt." To this succeeds, under the auspices of Professors Sedgwick and Phillips, a "whirlwind of opposing doctrine." And if, having with exemplary patience, made some balance of testimony and arrived at some conclusion under this difficulty, we march under the standard of the bold Sir Henry de la Beche, or the redoubtable Sir Roderick Murchison, we shall feel ourselves finally projected into a "vortex of uncertainty"! Such is the sum and substance of what we can ascertain about the origin of granite in "the present state of our knowledge."

Nor do we find ourselves very much better off when we come to define the place of granite among the great families of rocks. Some geologists hold that granite is not only the lowest, but, in its origin, the most ancient of all the substances which constitute the (so called) crust of the globe. For, wherever the floor or foundation upon which the subsequent or newer rock formations rest has been reached, or the escarpment or core against which they happen to be piled has been traced, that foundation, escarpment, or core is invariably found to be granite or a rock of granitic origin. Other geologists, however, of a more recent school, begin to regard this theory as erroneous. For granite has been found associated with formations of various ages. Even since the beginning of the Tertiary epoch, it has been discovered, that its intrusion among the eocene strata of Central Europe has raised the Alps more than 10,000 ft. above the level of the sea; and that granitic masses are found posterior even to the lias formation. In the course of the geological survey of Canada, under Sir William Logan, a vast series of crystalline rocks have been discovered superimposed upon a limestone containing organic remains. This, as Sir Charles Lyell pointed out, destroys all our preconceived notions of the order of the "primordial" rocks. On such a question one would suppose that the Scottish geologists would throw some light. "But no class of rocks are so little studied," says Mr. Page, "as the granite."* "Granite," says Professor Nichol, "was long described as the most ancient of rocks,—the first-born of old chaos. In Scotland I know none older than the gneiss, and much of the gneiss is younger than the old red sandstone."† The celebrated Scottish geologist, Dr. Macculloch, indeed, demonstrated as far back as 1824, from examples at Cape Wrath, in Sutherlandshire, the fact that granite had been erupted through a layer of gneiss;‡ and an equally celebrated Scotsman, Sir Roderick Murchison, has told us, only about ten years ago, that this "fundamental gneiss" is the oldest rock in the British Islands.§ These facts would seem to dispose most satisfactorily of the alleged superior antiquity of granite rocks; but more remains. "There is good reason to believe," says Mr. Geikie, "that granite is not an igneous rock at all, in the ordinary sense of the word;‖ but that, instead of bursting through and upheaving the gneiss and schist, it is itself only a further stage of the metamorphism of these rocks themselves." The opinions of geologists in the present day are therefore, it should seem, more and more tending to regard granite as possibly of very late formation; requiring, however, the co-existance of intense heat and gradual cooling under the influence of immense pressure—or at least an equivalent sum of the forces of chemical action. But it must be remembered, of course, that this is merely the latest opinion, and one upon which we do not feel ourselves called upon to pronounce.

We are on much safer grounds when we come to define granite as a mineral. Granite is a massive and compact aggregation of three crystallized minerals—quartz, feldspar, and mica, occasionally accompanied by minute proportions of other minerals, such as schorl, or tourmaline, zircon, actinolite, fluorspar, and talc. Granite assumes different forms according to the proportion of those ingredients, or to their presence or absence in the composition of the rock: thus pure granite consists of a mixture of about three parts feldspar, two parts quartz, and one of mica, whatever the colour. The French authors call the pure rock of this description eurite; when mica is almost absent from the group, pigmatite; and when feldspar occurs in abnormal quantities, the granite becomes porphyritic,—a term, we may mention, without strict scientific meaning. Indeed, the physical metamorphoses of granite are exceedingly variable: when schorl takes the place of mica, as in Devonshire, the compound is denominated schorl granite; when hornblende takes the place of mica, the compound is syenite; with equal proportions of mica, it is then syenitic granite; when talc is present in large proportions, the granite is said to be talcose. Finally, when mica preponderates to such an extent as to allow the rock to assume a slaty cleavage, it is called gneiss; which, however, by some geologists, is regarded as a metamorphic, and not a crystalline, deposit.

Of all these inferior granitic compounds, undoubtedly the most important is syenite,—a compound granular rock, composed of quartz, hornblende, and feldspar. Syenite is of a greyish colour, structure granular, sometimes coarse, sometimes fine. Its presence in Britain is comparatively limited; in granite districts the mica will occasionally be replaced by hornblende, and so produce it. But perhaps the most beautiful kind we possess is quarried at Montmade, in the north of the island of Jersey. In this variety feldspar is red, and the hornblende dark; and from this combination a rich purple tint is evolved in polishing the surfaces. Unfortunately it can only be raised in moderate-sized cubes, and so it lacks the perfectly royal character of its prototype, the true Egyptian syenite. In the British Museum, specimens may be seen in those quaint figures and emblems fashioned 3,000 years ago by that singular race of people, which are still apparently as fresh as when they came from under the tool of the sculptor, and give promise of an almost unlimited endurance.

We have no room to speak of the geographical distribution of granite; but with regard to its occurrence in the north of Scotland, we may state, on the authority of Professor Nichol, that igneous rocks are scattered irregularly over the whole country. Here they occur in large mountain masses; there in innumerable tortuous, branching veins, forced in among the strata. In mineral character they are equally various. First in importance and extent is granite, the most abundant variety of which is a uniform granular mixture of grey quartz, red or grey feldspar, and mica, silvery white or deep shining black. This kind prevails over wide districts in huge mountains, such as Loch-na-Gar, Ben MacDhui, and Cairn Gorm. But the present heights and hollows of the Highlands are not to be traced, Mr. Geikie tells us, to any of the original convolutions of the old crystalline rocks. Nor can they be assigned, as they often are in a popular way, to grand primeval eruptions of granite. That rock, it is true, covers a considerable space in the Highlands, and rises up among the highest mountain groups; but there are also wide spaces of low ground abounding in granite. The long, lonely moor of Rannock, for instance, lies, in large measure, on granite, while the range of mountains that bounds its south-eastern margin consists, not of granite, but of quartz rock.

We may here interpose a single word with regard to the climate of these granite mountains, in the very centre of which it must always be remembered her Majesty has fixed her summer residence. It is now well ascertained that the unhealthiness of a climate increases as the temperature rises above 60 degrees; and since the

* Advanced Text Book of Geol., p. 96. 1865.
† Geology and Scenery of the North of Scotland, p. 12. 1866.
‡ Geol. of the Western Isles, p. 262.
§ Quarterly Jour. of Geol. Soc., vol. xx.
‖ The Scenery of Scotland viewed in connexion with its Physical Geology, p. 97. By Archibald Geikie, F.R.S. 8vo. 1865.

summer temperature of the highlands of Aberdeenshire does not rise beyond 60 degrees, they offer the substantial advantages of the most healthy and invigorating climate *during summer* in the British Islands. Of course, the distinction between eastern and western districts similarly circumstanced with respect to hills, must be carefully kept in mind, as it makes all the difference between a wet and a dry climate. The rainfall at Ballater is only 21 in., while that of Portree is 140 inches.* The superior natural drainage of a granite soil is also an important element in the salubrity of the country.

We must now proceed to say something about the granite quarries. For about 200 years the working of granite has been known in the neighbourhood of Aberdeen for building purposes. At first the demand was very limited. But now the granite quarries constitute its most valuable mineral treasures. In the year 1741, the magistrates of Aberdeen ordained that the outside walls of houses should be built of stone, in consequence of a fire that burned down the old timber houses. This led to a vast increase of granite building. About the year 1764, the durability of Aberdeen granite being ascertained, it was recommended for paving the streets of London, and in the course of about thirty years, stones of larger dimensions were supplied. From Rubislaw the first known quarry, now the property of Messrs. John Gibb & Son, stones were furnished for the Portsmouth Dock, the Bell Rock Lighthouse, &c. About the year 1820, under the advice of Sir J. Rennie principally, large quantities of granite were supplied from various Aberdeen quarries, for Waterloo Bridge, Sheerness Docks, London Bridge, &c. The superiority of Aberdeenshire granite, owing to its durability and clean appearance, has yearly increased. The demand for carriage-ways, paving curb, building, and engineering purposes of all kinds, has given rise to numerous quarries being opened, the chief of these being Rubislaw, Dancing Cairn, Selathie, Tyre Beggars, Kennay, Cairngall, and Stirling Hill.

The ordinary granite of Aberdeenshire is a small-grained stone, of the common ternary compound of quartz, feldspar, and mica. Sometimes it passes into greenstone of the trap family, and sometimes into basalt. It forms the great mass of the Grampian chain. All the quarries around Aberdeen are of white granite, with a bluish tint. The granite quarried near Peterhead is of a red colour, and of much larger grain than that of Aberdeen. Of these local varieties of rock, we shall mention three, the grey, the blue, and the red. The grey granite is of a close grain, and contains more mica than the red. It is brought from quarries on the Dee, a short way above Aberdeen. The blue granites are partly supplied from the quarry of Rubislaw; but principally from that of Cairngall, a clear blue and finely grained material, which is more of a syenite than a granite, and is used for the finest description of work. The red granite is of a larger grian, abounding in feldspar, usually of a fine roseate hue, and in quartz of a clear pearly white, intermingled with small specks of mica. This granite bears the strongest resemblance to the Oriental syenite; it is chiefly found, as we have said, in the vicinity of Peterhead. These varieties of granite are often met with in the immediate vicinity of one another, and a granite of one kind may sometimes be found traversed by veins of a different one. As a general rule a stone could not be matched except from the quarry whence it was cut. The texture of the various rocks likewise differ much. For example, the felspathic crystals are found in every variety of size, from those of the coarse-grained Stirling Hill stone, to rocks in which they are microscopic in size.

The first impressions the traveller receives of an Aberdeenshire granite quarry are such as are not soon forgotten. Supposing we take a seat on some ancient boulder close to its upper verge, we may look down upon an excavation extending over a vast area, irregular in its shape and most striking in its varied outline. It presents the appearance, both in depth and length, of a huge crater-like void, the result of human labour extending through many generations. On the faces of the rock, slung by ropes in the dark recesses below, and upon the floor of the quarry, are gangs of workmen busy with various kinds of mechanical contrivances, and with the aid of horses, removing the ponderous stones; their real size is diminished by their distance and by the gigantic scale of the surrounding objects. Some quarrymen are shaping blocks to their final purposes, and others are carting away all the *débris* that is valueless. Suddenly a loud call from below, a shrill whistle, or it may be the sound of a horn, claims the observer's attention, and he is warned to retire to a distance safe from the effects of a blast of gunpowder, for by this force alone are large masses cleft from the parent rock. He seeks some friendly cover; and presently, far down in the very heart of the mountain, the mine explodes, and the stillness of the atmosphere is broken by its half-stifled boom. Upon returning to his seat, the voices of the workmen once more blend with the harmonious and peal-like ring of the highly-tempered steel tools; and the cheerfulness and general activity of the scene below again strongly contrast with the solitude and wildness above and around.

The granite in the Aberdeen quarries lies in huge irregular masses, with seams in all directions, in most cases from east to west, and the dip to the north, although there are rocks with nearly horizontal seams or "joints." Almost all the quarries are composed of liver stone, that is, of rock which splits in any direction. But it is highly important to know that granite, with all its seeming closeness of texture and obduracy, has even in the finest specimens a distinct cleavage, which is easily discernible by the experienced quarryman. His knowledge is, of course, useful to him in hammering or splitting a block; also in ascertaining the dip of the rock in the quarry. There is much rock of inferior quality, we may mention, owing to "dries," bad colour, quarry shakes, or other imperfections arising perhaps from the action of electrical currents or other obscure terrestrial phenomena.

The method of quarrying granite is very simple. The masses of rock are reft from their native beds, as we have seen, by gunpowder, introduced by means of boxes, formed by steel jumpers of the necessary length, from 10 ft. to 30 ft. applied by manual labour. These holes are charged by the proper quantities of gunpowder, which is exploded by means of a fusee impervious to damp. After the misshapen lumps of rock are dragged into the floor of the quarries; the cutters shape the stone roughly by driving soft iron wedges into holes made on the side of the intended fracture, placed about 5 in. or 6 in. apart. After this a final shape is given to them by a heavy punch, about twenty or twenty-five pounds weight, before the transit to the works or elsewhere. By this process the quarry masons are technically said to leave the blocks "scappled." But we must explain what that signifies.

According to the best authorities, the local varieties of worked Aberdeenshire granite are as follows, the terms differing somewhat from the English nomenclature:—

1. *Hammer-blocks.*—Used for basement,—foundations, &c. (underfitting).

2. *Scappled blocks.*—Squared with the heavy pick, for dock and heavy engineering work.

3. *Rough-picked.*—A better finish than No. 2 (used for similar purposes).

4. *Close-picked.*—The beds and arrises made fair, and the outer surfaces made as fine as the pick will make them. Used for ashlar.

5. *Single-axed.*—A finer finish than No. 4. Used for corners (quoins), rebates, and cornices, in house-building.

6. *Fine-axing.*—The finest finish given to dressed granite, by means of the patent axe we described. Used in the best work in house-building, for cemetery memorials, and as a finish to contrast with polished work.

In the Aberdeenshire quarries stones of very large size can be produced, and columns, such as those in the Exchange of Riga, have been furnished, of 25 ft. in length, of one block. Works are readily executed, composed of blocks from 5 tons to 10 tons weight, and when required, larger sizes can be given. The largest block of granite ever quarried in Scotland was from the Cairn-gall quarry, and intended for the sarcophagus of the royal mausoleum at Frogmore. It measured 10 ft. by 8 ft. by 4 ft., and weighed over 33 tons. We may add, that with ordinary care blocks of almost any size may be obtained, free from flaws or imperfections.

Quarried stones cost from 3s. to 8s. per cubic foot; but it is worth noticing that the practice has long existed on the Aberdeenshire estates, of the tenants being allowed their building materials for the carting away.

With regard to its physical properties, we may state, first of all, that Aberdeenshire granite gives 13 to 14 cubic feet to the ton, according to the variety and density of the grain; that is equal to a specific gravity of 2·613 to 2·956. Its bearing or crushing power is enormous. A small shaft, say 5 ft. long by 4 in. in diameter, will bear a weight of many tons. Beardmore* quotes the crushing force at 8,000 lb. per inch superficial: the experiments of George Rennie made granite crush under a load equal to 10,900 lb. per inch super. Its breaking point is very high: in such work as lintels, &c., over an opening it will bear considerably more weight than any stone whatsoever; but as yet no experiments have been made to determine the limit.

All these varieties of granite are susceptible of a high and enduring polish, which they retain, unimpaired by the weather, in almost any climate. As to the absorbing power, some open grains will imbibe a considerable quantity of moisture; but in all the finer varieties it is imperceptible.

The durability of granite is a very important question, and would require more space than we can at present afford to do it justice. Aberdeenshire granites, from the nature of their mineralogical structure and their physical constitution, are undoubtedly the most durable of rocks. In weak granites such as those of Devonshire the feldspar usually preponderates, which is very liable to decomposition from the action of the atmosphere. The celebrated "Kaolin" or porcelain clay, which is found in large beds or deposits in the valleys of Cornwall and Devon, consists entirely of the quartz and mica which have been set at liberty by the decomposition of the feldspar of the granite rocks. In selecting, therefore, a granite for any of the innumerable uses to which it is applied, the presence of feldspar in irregular and inordinate quantities is to be avoided. Such decomposition is equally noticeable in Limoges and North-western Spain. It should be added that the porphyries of Egypt and Cornwall are very beautiful when polished, although their beauty depends on the very cause which leads to their decay—the presence of large crystals of feldspar. As to the durability of granite used in buildings, it can be shown in Aberdeen that it never decays in any appreciable degree. For on the oldest specimens, which must have been taken from outlyers or stones on the surface several hundred years ago (these being, of course, inferior materials), the marks of the workmen's tools are still distinctly visible. Reasoning from analogy, we should say that granite is the proper material for light-houses and sea-walls, even by the process of natural selection. Compare the bluff headlands of Cornwall and Peterhead with the chalk cliffs of Sussex and Kent, or the Norfolk marls, or even with the coast lines of red sandstone. But we should, at the same time, hesitate to say that it was always and under any circumstances the best material for foundations, particularly when exposed to the action of mineral springs and other subterranean solvents. As to its durability when applied to building and interior decoration there can be no dispute.

For all such purposes of the architect and the engineer granite is every day getting more in request. We need not refer to the Thames Embankment and the Mersey Docks, nor is it necessary to mention its uses in sea-walls and piers, in viaducts and bridges. It should seem that mounds of earth or huge walls of granite are now the last resources of the military engineer who presumes to contend with Armstrong guns and such like missile weapons. One most appropriate use of large granite blocks is that of carrying the heavy weight and sustaining the extraordinary vibrations of ponderous machinery. Upon these applications we cannot dwell at present. We shall conclude with a few words on the subject of granite pavement and granite buildings.

The granite cubes intended for paving and such work in the streets of London are all prepared in the quarries. They were used for a long time with not much work on them, so that the streets were rougher a good deal than they are at present, and required more repair. About the year 1820, the institution of Civil Engineers considered the subject, and the late Mr. Telford, the president, suggested several improvements in the preparation and laying out of the stone,—which, though costing more money, were generally adopted by the parishes and surveyors. The form most approved of at present seems to be a thin cube, about 9 inches in depth,

* See the Rev. J. T. Morris's "Treatise on Meteorology," p. 92. 1866.

* Manual of Hydrology. 8vo. London. 1863.

3 inches in thickness, and not exceeding 18 inches in length, fair-dressed throughout, and the top not kept too smooth. Owing to the closeness and toughness of grain of the Aberdeen granite it has long been used for paving, curb, pitching, &c.

But for this purpose suitable material is found in the Channel Islands, in Ireland, in Argyleshire, Dumfriesshire, and other places. These dressed granite cubes, however, so famous for their durability, still form a staple export at Aberdeen. The gross quantity shipped at that port in a year on the average amounts to 50,000 tons, and the value of the commodity varies from 22s. to 30s. per ton; and this, it must be remembered, is only one branch of the granite trade.

Cheapness at the quarry and facility of transport, accompanied with fair quality, will always determine the introduction of such unopened granite supply.

In order to study granite building we must go to Aberdeen. The houses in that northern city are built chiefly of dressed ashlar in their front walls, while the back is composed of square hammer-dressed stones, and the gables, when there are no window openings, of rough or mashed rubble. The back and gables are, generally speaking, rough cast. The dressed ashlar consists of stones, very nearly of one uniform size, varying from 18 in. by 12 in. to 24 in. by 12 in. The cost of granite masonwork, we were told, is about one-fourth more than freestone, and about one-third more than brick; but since political economy requires that houses should cost about the same in whatever quarter of the country, it is necessary to make up for this increased cost of the external walls by punishing the interior; the timber work, accordingly, of the Aberdeen houses is uncommonly slight, the scantlings are very small, and the finishings inexpensive. The plumber work is better than we expected, but the plaster work is very poor. We cannot help thinking that such a distribution of the cost might suffer some amendment. Such cyclopean masonry, perhaps, may be a necessity of the material; but that it is neither the soundest in point of construction, nor the most economical in point of cost, no one who has studied the subject can doubt for a moment; for an eye accustomed to linear perspective will detect even in Union-street faltering lines in the lintels, and irregularities in the cornices of those heavy granite buildings; and there can be no doubt that the question of expense has operated to a serious extent in retarding the erection of that humble class of domiciles of which at this moment Aberdeen stands so much in need.

## MONUMENT TO SCHINKEL AT BERLIN.

A MONUMENT is about to be erected to the memory of a man who has done more than any one else to adorn and beautify the Prussian metropolis, and whose name is as well known as his talents and genius are appreciated in architectural circles in every country in Europe.

Carl Friedrich Schinkel was born March 13, 1781, at Ruppin, in the province of Pomerania, which at that time belonged to Sweden, but is now part of the Prussian monarchy. His father, who was a Lutheran clergyman, died in the prime of his life, and his mother removed to Berlin in 1794, to give her son the advantage of a better education than he could obtain in a small country town. When Schinkel, at the age of eighteen, left the gymnasium or high school of the Grey Convent, there was an exhibition of the architectural drawings of the younger Gilly, who was celebrated for the classical beauty of his designs; and these awakened in the youth such a degree of enthusiasm for architecture as to decide him at once on the choice of his profession, in which he subsequently made such a brilliant career. Under Gilly's guidance he applied himself so diligently to his professional duties that, on the death of that architect, two years later, he was employed in finishing those buildings that were not completed. But the state of war in which Prussia was at that time involved, and especially the occupation of Berlin by the French armies of the First Empire, were certainly not favourable for the erection either of public or private buildings, and Schinkel was obliged for some time to utilize his talent for painting, in order to earn his daily subsistence. Having made a journey to Italy to complete his studies, he painted some landscapes, many of which are still preserved in the National Gallery and the Collection of the School for Architecture, which established his reputation and gave him the means of living comfortably and supporting his aged mother in comparative affluence. On the conclusion of peace he returned to his favourite profession, in the exercise of which he advanced rapidly and gained official favour; for, in 1810, he was appointed member of the Government Board of Architecture; in 1811, he was elected a member of the Academy of Arts; in 1815, he became Architectural Councillor (*Geheimer Ober-Bau-Rath*); and, finally, in 1839, Head Director of Public Buildings, which post he retained till his death, on the 9th of October, 1841.

The first architectural work of importance, erected by Schinkel at Berlin, after the close of the war, was the head guardhouse, opposite the palace of the then king (Frederick William III.), which is generally admitted to be a striking specimen of the Doric style of architecture. But he had previously given ample proof of his genius and powers of invention, for it was from his designs that the triumphal arches and other festive decorations that adorned the city on the happy return of the king and the royal family were erected. These designs are reverently preserved in the School for Architecture, amongst the collection of three thousand six hundred drawings, by his own hand, in the possession of that institution.

Schinkel's reputation as a first-rate artist was now unequivocally established, and it gave him plenty of occupation, not only at Berlin, but in the provinces, and even in foreign countries, especially in Russia and Poland. When the seat of the Greek government was removed to Athens, in 1834, Schinkel received a flattering letter from King Otho, inviting him to come to Athens to select a site for the new palace, and make designs for the same. He did so; and the drawings he made on that occasion, which the writer of this article has had an opportunity to examine, are of the most splendid description, and well worthy of the genius of such an imaginative artist devotedly attached to the classical style of architecture. His idea was nothing more nor less than a full restoration of the whole of the Acropolis, including the Parthenon, or Temple of Minerva, and the beautiful Erechtheum. He proposed to pull down that barbarous great square tower erected at the western end, in the Middle Ages, and to remove the quaint though characteristic battlements on the north and south sides that denote the period of Venetian rule and power: the entrance was to be by the Propylæa, as of old, but modified for practical use, and the adaptation of a handsome carriage-road winding round between the Pnyx and the Areopagus. And in the midst of these restored classical remains of antiquity and former splendour was to be placed the palace of the young monarch who had been called to rule over these turbulent Greeks, and who had been wisely counselled by his royal parent that it was far more honourable and deserving of credit to be called the Restorer of Athens than the Founder of Othonopolis, as it was proposed by a very strong party to name a new city to be built on the Isthmus of Corinth as the metropolis of the kingdom.

But all this labour—and none but a practical architect can fully realise and appreciate the amount of labour bestowed on such a comprehensive scheme, with all its elaborate ornaments and other details—was unfortunately thrown away, and the magnificent idea shipwrecked, as many other bold designs have been before, on the rocky shoals of pecuniary expense; for it was found that the execution of the works would have cost a great deal more than the whole annual revenue of the young kingdom. Besides, the practical king of Bavaria (Ludwig I.) did not fail to point out the inconvenience that must necessarily arise from having the new palace placed at so great a distance from, and at such an elevation above, the city. And thus the plan was abandoned, and the designs of Professor Gärtner, of Munich, adopted and executed, both as regards the site and the style of architecture.

Berlin is indebted to the genius of Schinkel for most of its present ornamental public buildings, among which may here be mentioned the new Museum, the Theatre Royal, the Werder Church, the bridge leading to the palace, the Academy of Arts, and four churches in the suburbs. At Potsdam he built the St. Nicholas Church, the Casino, the bridge over the Havel, and Castle Glienecke; at Aix-la-Chapelle and Hamburg the theatre; at Oppeln and Düsseldorf the Government buildings; and at Colberg the Hôtel de Ville. The restoration of the ruined castle of Stoltzenfels on the Rhine was executed from his designs after his death by his pupil Stüler, as was also the Palace of Babelsburg (the favourite residence of the present Crown Prince) by his former pupils Persius and Strack, though with some modifications of the original conception. He likewise painted the originals of the great fresco pictures under the arcade of the Museum; and from his designs the Gothic monument was erected to the memory of the Prussians who fell in the war of liberation, on the Kreutzberg at Berlin. Besides these, he made innumerable plans and designs for buildings that were never executed, among which was a palace for the Emperor of Russia in the Crimea, a Gothic Cathedral and a Guildhall for Berlin, a country palace for the King near Potsdam, a monument to the ancient Teuton hero Hermann, who delivered Germany from the Roman yoke, and seven different designs for a monument to Frederick the Great. He also commenced and made considerable progress with a Manual of Architecture, in which he intended to embody his own professional experiences for the benefit of future generations. This work was never completed, but the 463 drawings he made to illustrate it and the manuscripts found among his papers tend to show the elaborate footing on which it was his intention to publish it.

With all this labour on his hands, Schinkel found time to pay attention to every new invention and improvement in the arts. The Berlin theatres are indebted to him for the original sketches of the beautiful decorative scenery for which they are so justly famed, having made nearly a hundred, which were all executed by Gropius. He was always applied to, to furnish decorations for court festivities and masquerades, and uniformly acquitted himself to the perfect satisfaction of his Royal employer.

The monument about to be erected is to take the form of a colossal statue of the deceased, the head being uncovered, and the body of the figure partly enveloped in the drapery of a cloak; the left hand holds a scroll, and the right one a pencil, as if about to embody a new idea that has flashed across his imagination. It will be placed on the square in front of the Academy for Architecture, which was built by himself, and in which for many years he gave lectures to the rising generation of artists. Professor Fr. Drake has just finished his model of the statue, which embodies in a striking manner the personal features and figure of the deceased, in the adaptation of which that sculptor has already given proof of his eminent talent, as evinced in the statue of the late Professor Rauch. In both these cases the problem was perhaps more easy to solve for him than any other artist, as he was for many years on terms of the greatest intimacy with both these distinguished men, and therefore enjoyed a peculiar facility of embodying their personality in a work of art, and in the case of Schinkel even of making use of a model statuette taken during his lifetime, and for which he stood to Drake in 1830. This statuette, indeed, forms the groundwork upon which the new statue has been modelled.

## THE EXHIBITION OF NATIONAL PORTRAITS.

THE private view of the collection on Saturday last was attended by about 1,300 persons, including many eminent individuals and lovers of art. The opinion was pretty generally expressed that, spite of obvious objections and inconvenience, the determination on the part of the managers of the Exhibition to accept the title and the painter's name given by the various owners of the pictures, was right. The principle adopted, however, ought to be well understood by visitors, or they will be led to rare beliefs. Mr. Samuel Redgrave, who has had special charge of the Exhibition, has prefixed to the catalogue a brief introduction. The catalogue itself has been compiled, with pains, by Mr. R. H. Soden Smith, the Rev. J. Beck, and Mr. R. F. Sketchley. In the introduction, reference is made to the discovery of the will supposed to be Holbein's, which, if that opinion be correct, would, as our readers know, dispossess him of the authorship of important pictures that have been ascribed to him. Mr. Redgrave says it is almost universally stated that his death took place in 1545, and that the will discovered would prove his death to have happened in 1534. There is some slip, however, here. The generally ascribed date for Holbein's death is 1554; and the will found by Mr. Black would make it

1543. We agree with Mr. Redgrave in thinking there is yet just sufficient absence of absolute proof of the identity of the testator with the painter to allow of that further examination of a question of so great interest which the present collection very opportunely offers.

"The distinguished antiquaries who have come to the conclusion that Ho bein died eleven years earlier than the date hitherto accepted, have felt the difficulty as to the painters to whom must be attributed the portraits of the latter end of the reign of Henry VIII., and during the reign of Edward VI.; and they name, chiefly from the household books of the former sovereign, some painters, also mentioned by Walpole, who they think might have been the painters of these works, and whose reputation has been merged in the fame of Holbein. But it would not be difficult to show that these were mere craftsmen, employed in painting the heraldic devices of the time, whose art had nothing in common with the art of Holbein."

Up to this time the question has been left in the hands of the antiquary. No distinguished painter has expressed any opinion, yet it is one on which the artist might be able to judge. Mr. Redgrave thinks an artist's professional knowledge would enable him to trace the technical manner of painting, and the characteristics which constitute the originality of all true genius: and thus determine, with as much certainty as with regard to hand-writing, whether the earlier and the later works which have been usually attributed to Holbein, are the productions of the same mind and the same hand. Where, however, shall we find the man who can do this with certainty. It is a much more difficult matter than Mr. Redgrave thinks. There is at this time no person, Mr. Henry Farrer being gone, who has any public reputation for a knowledge of old pictures. The opportunity, nevertheless, should not be lost, but an endeavour should be made to settle this Holbein question.

The exhibition brings creditably into notice the works of some native artists,—John Riley (died 1691), John Greenhill (died 1676), Michael Wright (died about 1700), and a few others, not very widely known.

A meeting of the Committee of Advice was held on the preceding Friday, the Earl of Derby in the chair, when future arrangements were discussed. It was asked if pictures of the remaining periods were to form one or two exhibitions, and it was answered that this would be regulated by the favour shown by the public to the present attempt. Some amusing sparring took place between the Chairman and Lord Granville touching the Bill to enable trustees to lend pictures for such a purpose without responsibility, which passed the House of Lords, had been sent to the Commons, and was never heard afterwards. It has, however, since turned up.

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On the opening day (her Majesty and the Prince Consort present) of the Art-Treasures Exhibition of the United Kingdom, "collected at Manchester in 1857," he who largely helped to form it had the high pleasure of conducting England's late much-valued and lamented Prime Minister over the "British Portrait Gallery."

Lord Palmerston that morning was "in merry pin," willing to communicate, willing to listen, and willing to learn. He looked and lingered, with singular delight, at the Bodleian picture of the great Lord Treasurer Burleigh, mounted in state on a mule. A noble friend, within seeing and within hearing, caught the statesman's eye, dwelling, with a twinkle of roguish humour, at the picture. A brother peer asked (with a wink) Burleigh's living representative as Lord High Treasurer what he would "take" to go as Lord Treasurer, mounted, Burleigh-like, on a mule, from Downing-street, along Piccadilly, to the Ring in Hyde Park. A loud fit of laughter (of the Premier's starting) was the appropriate reply. Lord Palmerston more than appeared to enjoy the collection of portraits with a keener relish of what he saw, and so well understood (actual art, perhaps, excepted), than any other part of the whole exhibition.

It is odd (we may observe, laughingly), before we become critical and eulogistic, that the exhibition of a Crown educational committee should commence its course of instruction, its universal "little go" and "great go" with (No. 1) Rosamond Clifford.

"Who has not heard tell of fair Rosamond?"

lent by her Majesty from Hampton Court, with No. 33 (Jane Shore), from the same Royal palace,—

"Hampton me taught to wish her first for mine;"*

* Henry Howard, Earl of Surrey.

and close its exhibition with Lucy Walters, Moll Davis of the Duke's Theatre, and Nell Gwyn of the King's, and those famous ladies, the *Goodwood* (Carwell) Duchess of Portsmouth, the Jennings Duchess of Tyrconnell. We do not complain; we only smile,—an exhibition of the kind (which all fully approve) could not be successfully complete without such chronological characteristic canvas and panel representations.

The Duchess of Portsmouth was the last survivor in the flesh of all who re-appear on canvas or panel at Kensington. She died in 1734.

Critics, connoisseurs, artists, auctioneers of art, collectors, and dealers, are properly loud in expressive admiration of a small panel portrait (12 in. by 9 in.), a Gorhambury Grimston (No. 17 in the catalogue),—unknown in life, but now memorable in death and—in art. "Edward Grimston." The catalogue (sadly confused in its dates) tells us that it is inscribed on the reverse, "Petrus Christus me fecit anno 1446." This, then, is an early ancestor of the founder of the Grimstons of Gorhambury, and of Sir Harbottle Grimston, the friend and patron of Bishop Burnet. One of the many uses of a gathering like this at Kensington, is the discovery or "find" of a work altogether unknown to men who have had many opportunities of seeing and cataloguing the galleries and cabinets of art in England. The *Holbein* of the founder of *Trinity* College, Oxford, Sir Thomas Pope, lent by the Countess of Caledon (from Tittenhanger), is more than fine, and almost a discovery and recovery at the same time.

All who remember Hampton Court thirty years since will be glad to renew their acquaintance with one of the finest Holbein portraits in the world, the portrait of Sir Henry Guildford, which the late Prince Consort had the good taste to appreciate and the hard-heartedness to carry to Windsor, where it was seldom seen.

The "Erasmus," by G. Penny, contributed by her Majesty, made us fretful, and wishful that Dr. Mead's Erasmus (a genuine Holbein) had left, on loan, Longford Castle, in Wiltshire, Earl of Radnor's, for a little Kensington air and a larger approbation.

Unhappily the Cardinal Wolsey (148), sent from Wolsey's foundation (Christ Church College, Oxford), is a repainted portrait, though the best we possess of the Cardinal Archbishop of York, in his "full-blown dignity" or "vanity" of "Human Wishes." Wolsey, in the representations that have survived (none good), is drawn holding a silver pomander-case in his hand, as a disinfective. When sitters could not produce silver pomanders, ingenious face-painters (Kit-Kat size was then unknown), introduced oranges, each stander or sitter in the family group holding an orange,—a custom immortalized in art and literature in the famous family picture of "The Vicar of Wakefield."

No. 163, "The Family of Sir Thomas More," by Holbein, a much talked-about picture, calls for fuller consideration than we can give to it after a short though careful inspection. Its presence at Kensington will awaken our antiquaries and artists, and find ample employment for the many skilled contributors to "Notes and Queries."

The fine Mabuse (58) "Three Children of Henry VII.," from Hampton Court, the editor could have told us, is not so fine as the Wilton (Lord Pembroke's) original, or as the Corsham (Lord Methuen's) repetition.

Of the elder Sir Thomas Wyat, of the reign of Henry VIII., we have interesting examples (68), from the Bodleian; and (98), the property of John Bruce, F.S.A., who is known to have given laborious and successful attention to the lives of the Wyats. Lord Romney contributes a portrait of the younger (No. 182), possessing, it is said, a good genealogy.

Among the "Portraits of Painters," by themselves (No. 186), Sir Antonio More, sent by Earl Spencer, from Althorp, is marvellously fine. It is a three-quarter.

Of Queen Mary (Queen of Philip of Spain) Mr. Stopford lends an instructive and valuable Lucas de Heere. In her right hand is a paper endorsed "The Supplication of Thomas Hungan." Who was Hungan?

As Burleigh House and Hatfield House require more than golden keys (of Lord High Treasurer and Lord High Chancellor) to get into, disappointed travellers for instruction and pleasure in England will be pleased to find that the two Cecils—of direct Lord Burleigh extraction, the Marquis of Exeter and the Marquis of Salisbury—have contributed largely from their ample resources.

The Earl of Yarborough's Walter Devereux (263) *first* Earl of Essex, though a good picture, is not genuine.

The collection is happily rich in Queen Elizabeths. The finest of all is the Marquis of Salisbury's, well known by the engraving before Sir Henry Ellis's "Collection of Historical Letters." We shall have a few words to say hereafter on the portraits of a great Queen, whose birthday (17th November) was a holiday in London (especially among the apprentices) a century after her death.

In "similitudes" genuine and doubtful of Mary Queen of Scots, the collection is rich. The subject of Mary's portraits has been treated with so much exhaustive exactness by Mr. Albert Way, that it is no longer a subject—to let.

The Chandos Shakspeare (No. 335), lent by the National Portrait Gallery, more than suggested and pleasantly recalled a few criticisms and personal recollections for another week's *Builder*.

The catalogue, — an octavo of some 200 pages,—is as yet only in "proof," inviting revision: most of it is done with care. The measurements, taken within the frame, are especially to be praised for present and future use.

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## THE CONSTRUCTION OF PINERIES.

As very fine pine-apples have been produced in abundance in this country, fruit having been got from planted suckers in little more than eighteen months by a right mode of procedure, it may be well to give our professional readers and amateurs an idea of the kind of pineries which have been used by a successful cultivator, whose produce has been spoken of in the horticultural press with high commendation, and who has obtained other distinctions in consequence of rearing pine-apples of the finest quality.

To this end we shall glean a few details from a practical and well-written treatise on the subject by Mr. David Thomson, of Archerfield Gardens, in Haddingtonshire, Scotland.*

The pine-apple, we may, in the first place, briefly remark, derived its name from its striking resemblance in shape to some pine-cones. It is a native of the West Indies, and was first introduced into this country from Holland, in 1690.

The situation of the pinery should be one well sheltered from cutting winds, and having a full south aspect. There is nothing that necessitates hard firing to keep up a given temperature more than exposure to high winds, and the more conducive to healthy growth will the atmosphere be when the heat can be maintained without hard forcing. The sheltering objects, however, must not be allowed to interfere with a full exposure to sunshine at all seasons.

During by far the greater portion of the year, pines cannot possibly have more light and sun than is necessary to produce a stocky fruitful growth in the dull atmosphere which so much prevails in this country. Pineries should, therefore, be constructed so as to admit and diffuse as much light and sunshine as can be had. In the few months when at times the sun may be more scorching than is desirable, a slight shading can easily be applied. When the sash-and-rafter principle is adopted, Mr. Thomson advises that the sashes should not be less than 6 ft. wide, and divided into five openings or panes of glass.

For summer growth he gives the preference to span-roofed houses, running north and south (fig. 1). In the morning and afternoon they receive the full sun, and for a period in the middle of the day, when the sun is in his meridian, the pines are, in such houses, partially shaded from the scorching rays of the sun, while at the same time they are exposed to a great diffusion of light. Such houses are decidedly the best for summer growth; but, for six months of the year, they do not, from their position, embrace so much direct sunshine as a lean-to house facing due south. Moreover, from the greater amount of glass as a radiating surface in span-roofed houses, they require more fire-heat to keep up the temperature. In these respects the lean-to gives advantages over the span-roofed pinery in whatever position the latter is placed. For starting pines in December and the two following months, as well as for swelling off fruit during winter and early spring,

* A Practical Treatise on the Culture of the Pine-apple. By David Thomson. W. Blackwood & Sons, Edinburgh and London. 1866.

## CONSTRUCTION OF PINERIES.

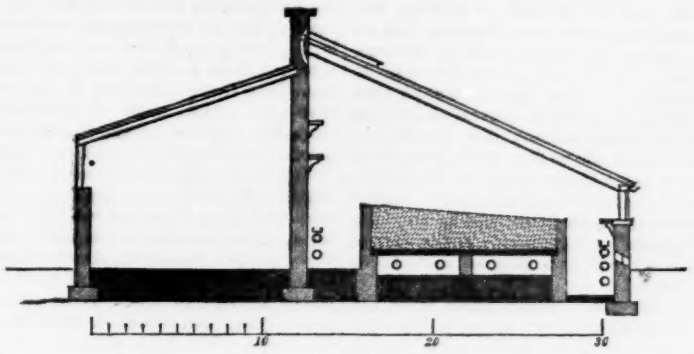

*Fig.* 2.

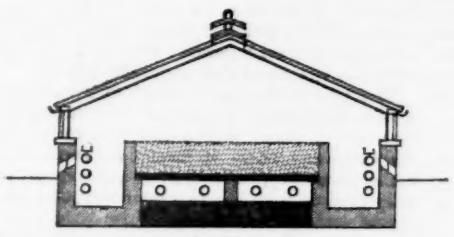

*Fig.* 1.

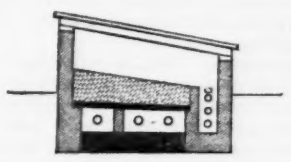

*Fig.* 3.

lean-to houses, as represented by fig. 2, are recommended.

The dimensions of the two pineries represented by the woodcuts are 40 ft. by 18 ft., which give a house of handsome proportions. It is more desirable to have several structures of moderate size than a less number of larger ones. A constant succession of ripe fruit is much more easily kept up by having a number of compartments.

For a sucker pit, a common lean-to pit, as represented by fig. 3, is very well adapted, as the young plants can be kept near the glass, and well exposed to light. It will be observed that the accommodation preferred and recommended is partly span-roofed and partly lean-to.

In the formation of the pine-ground, the lean-to or early houses should be on the north of the space selected, so that the back wall forms the shelter from the north which is so desirable; the span-roofed structures to stand north and south, or at right angles with the early lean-to houses, and at a sufficient distance from them not to obstruct sunshine. The early house would thus be nearest the boiler in the back shed, and would form the best shelter to the span-roofed or succession pits, which should not be very high. Such houses and arrangements are not absolutely necessary for the production of first-rate pines; but these arrangements afford great advantages and convenience.

The pine-apple being a fruit which requires a high temperature, particularly in some of its stages of growth, there should be a good command of heat both for top and bottom. It is only a false economy to stint the amount of pipes employed, but a larger heating surface moderately heated is much more conducive to the health of plants than a smaller surface kept at scorching heat. Mr. Thomson therefore recommends, as shown in the sections given, a liberal amount of pipes, and plenty of boiler power. Besides this, he feels fully persuaded, from his experience in the use of coverings applied to the glass, that, in the case of fruit swelling off during the colder months of the year, the double glazing now discussed in the gardening press would be an immense advantage.

A decided objection is made to flat-roofed pineries. They are dark, and very productive of drip in winter, both conditions undesirable in the culture of most plants, and particularly in that of the pine-apple. Ventilation should be amply provided for at the apex of the roof; and, particularly in fruiting-houses, there should also be ventilators at intervals along the front, so placed as to cause the air to pass inward in contact with the hot-water pipes. Front ventilation is not to be recommended as a rule, but it is well to provide for it in the erection of pineries, so that in very hot, calm days it can be applied, especially in the case of fruit that is colouring.

All pineries and pits should be provided with a steadily-acting steaming apparatus, which can be used or not, according as circumstances demand. An open gutter rising out of the flow-pipe at the front of the house, into which the water, on its way from the boiler, flows and passes along the whole length of the house, and descending into the return-pipe, is the best means of keeping up a steady supply of moisture. This can be used or not, at the seasons when moisture is required or not required, by simply corking up the pipes through which the water flows into the open gutter. The pipes should also be so arranged that, by means of stop-cocks, the bottom-heat can be shut off, and applied and regulated according to the amount recommended for the different stages of the growth of the pine.

In all pine-stoves there should be a tank into which to conduct the rain-water from the roof, and passing through the tank a coil of hot-water pipe to warm it. This, in cases where pines are grown extensively; saves a vast amount of trouble in warming water, or in drawing it from the heating apparatus, which latter, on account of its rustiness, is not desirable.

The house or pit intended for the reception of the sucker plants after they are shifted should be thoroughly cleansed. The glass and woodwork should be all washed, and the walls whitewashed with hot lime, so that there may be admitted and diffused as much light as possible, which for a stocky and fruitful growth early in the season is one of the most important conditions in the cultivation of the pine-apple. In the case of those who are dependent on fermenting material for bottom heat, all that may be necessary in relation to that will be to mix into the surface of the bed about 6 in. or 8 in. of fresh tan, well mixing it with a foot of the surface of the old bed.

As to the best sorts of plants for culture, and the details of management, we must refer our readers to Mr. Thomson's volume, in which they will find instructions to enable them to keep up a constant succession of fine ripe pine-apples all the year round,—when they know how to do it.

## PROFESSIONAL NOTES IN MEXICO.

HAVING recently returned from travels in Mexico, it may be interesting to your readers to have some further account of my wanderings in foreign lands, in the shape of professional and other notes.

I left England and its advanced civilization with feelings of regret, for the barbarous wilds, extensive prairies, and dense forests of this semi-civilised empire of the adventurous and gifted Maximilian. Our voyage out was of the usual monotonous cast, rough seas and wild skies, breezes and storms, storms and calms, but still the gallant steamer carried us safely through, and we arrived at St. Thomas, that singularly picturesque little island, of the virgin group, "the gem of the Tropics." After separating, with regret, from many of our fellow voyagers bound to other places, we pursued the even tenor of our way over seas without a ripple, with cloudless skies, and soon reached Cuba, along the north side of which we coasted, and entered the beautiful harbour of Havana, a strong "north" prevailing at the time.

This harbour is perfectly land-locked, very capacious, and has a narrow entrance; it is strongly protected by six forts, and it is generally considered one of the best and most commodious in the world.

The city of Havana is situated in close proximity to the harbour, and has a very picturesque and beautiful appearance from it; the buildings are principally erected of a bright cream-coloured stone, handsomely decorated, and with many-coloured verandahs, balconies, and jalousies, giving the whole a splendid aspect when lighted up by the bright rays of a tropical sun.

Having heard so much of this far-famed city of the West, I landed to explore and examine the place and judge for myself whether the glowing descriptions given of this beautiful city were overrated or not, and I was much delighted and gratified with my visit. The city is well laid out, and it possesses many magnificent buildings, of the Spanish type of architecture; but many of the streets are narrow, erected thus, doubtless, to exclude the rays of a tropical sun. The streets appeared to be well paved and flagged, with water channels down the centre; but the drainage is very defective, and the water-supply, which was very deficient, is about to be improved by the establishment of waterworks. As in most ancient Spanish-built towns, the "Plaza des Armis," occupies an important feature in the plan, serving at the same time as a central place for military reviews or evolutions of troops, and a useful place of exercise and promenade for the inhabitants.

In the "Plaza des Armis," is situated the Captain General's Palace, a building of considerable extent and magnificence, and adjoining it are ornamental gardens, embellished with statuary. The "Paseo" running through the centre of the city is also an object of great attraction, as it is beautifully laid out and ornamented with statuary and numerous fountains, and when lighted up, as it is, brilliantly at night, and adorned with graceful and elegantly dressed ladies, flitting about in their aërial-like Spanish costume, the place has a fairy-like aspect.

In the "Paseo" I observed a street tramway, worked by horses and cars, on the American principle, and which is connected with the railways laid out in the island, but which rather marred the beauty of the scene, as railways are seldom picturesque. It is, nevertheless, found very convenient, and is worked with advantage there, although such a system of transit is not thought desirable in "modern Babylon."

At night the streets are splendidly illuminated with lamps, which gives the peculiar picturesque architecture (Spanish) of the place a striking and dazzling effect.

There are many well-filled and handsomely arranged "stores," where all the productions of the civilized world may be purchased, and the most refined and *recherché* taste gratified; the streets, in the cool shade of evening, abound with well-built and elegant carriages and richly caparisoned horses,—the horses, harness, and carriages being bedizened and covered with silver; and there are many equestrians with silver ornamented dresses, and saddles and bridles richly mounted with silver. These generally drive in or parade the streets in the witching hours of evening, luxuriating in the delights and splendour of the place, and astonishing and dazzling the eyes of those unaccustomed to such displays of wealth and magnificence.

I was much interested in a strange-looking and rather elegant carriage, called a "Volante." It is made to hold two persons, and sometimes a low middle seat is fixed to accommodate a third. There are two very huge wheels, larger than a Hansom's, rough, strong, and thick, and of considerable weight. The axles of the wheel are not capped, but the naves are made of steel, polished. The body is not unlike a cabriolet's, and is supported on the axletree, and swings forward from it on springs, so that the whole weight, instead of being supported, hangs from it; the back of the carriage

is open, and a curtain is arranged to draw and to cover the open space when necessary. A metal band is placed across the footboard, to support the feet, and is polished bright so as to look like silver. The shafts extend from the back of the carriage to the front, where they touch the horse at the saddle, and are about 14 ft. long, and do not go beyond the lug depending from the saddle in which they hang. This immense length leaves a wide interval, exceeding 6 ft., between the carriage and the horse's tail, and therefore a large part of the weight rests on the horse's back, and in addition he has to carry a postilion; but with the fashionable world of Havana a second horse is sometimes used, and the postilion rides the second horse alongside the other in the shafts. The postilion, who is generally a negro of the blackest hue, wears a gay and showy costume. The usual dress is white breeches, scarlet jacket with gold lace, and broad-brimmed "Panama" hat. Many of the "volantes" ply for hire, like the cabs of London.

Amongst the buildings of interest there are the cathedral and several Catholic churches, and some well-conducted hotels, a theatre of considerable magnitude and splendour, and other places of amusement. The governor's garden, outside the walls, is also an object of great attraction. In fact, Havana may be considered the most prosperous, splendid, and luxurious city in the West; its commanding situation on the map of the world, the picturesque character of the scenery around, the capacious harbour, affording ample accommodation for shipping, are advantages which few localities possess, and which place this lovely city in the first rank of importance in the Western world.

But with all its wealth, luxuriance, and elegance, its advantages of position, and facilities for trade and commerce, it is far from being a desirable place of residence, — there lurks within its charming roseate boundaries a deadly and blighting foe, a penetrating insidious miasma, that preys fearfully, and too often fatally, on Europeans: I mean, yellow fever. None that are not thoroughly acclimatised can withstand the attacks of this dreadful enemy to man; and I sincerely believe the deadly effect of this disease arises principally from deficient sanitary arrangements: the drainage is very shallow and deficient, and there are untrapped gratings at intervals in the street, emitting offensive smells. The water-supply is bad (or was), and the back accommodation to the houses is generally of such a filthy character as to disgust most Europeans.

I believe, if perfect sanitary works were introduced, the health of Havana would improve; the deadly misasma that emanates from and floats about over the fair city like a pall, impregnating the atmosphere you breathe, would be overcome; and, with the aid of the delicious cool trade-winds, pure air would circulate abundantly through the streets and in and amongst the houses, and the blessings of health would be added to the charms of this beautiful city.

At New Orleans, where General Butler organized even an imperfect system of drainage and other sanitary regulations, the general health of the place is much improved, and cases of yellow fever are scarcely known.

We left Havana with regret, having reposed within its delightful precincts only twenty-four hours, and soon reached the Gulf Stream, keeping well to the north of the dangerous Campeachy Bank, where we met with a current so strong, that we could scarcely make head against it; and on the morning of the fourth day after leaving Havana, we were roused up by daybreak to see the celebrated Peak of Orizaba, a volcanic cone-like mountain, some 17,000 feet above the sea, with about 5,000 feet of its summit enveloped in a mantle of perpetual snow: we were then about 150 miles from Vera Cruz, and more than 250 miles from the Peak.

The mountain had a very singular appearance when viewed from the sea. Sometimes partially obscured with clouds, its snow-capped summit would appear above, looking like lands suspended in the heavens; at others, the light fleecy clouds would pass away, and the rising sun, in gorgeous splendour shining, would reflect its many-coloured beams upon this grand and imposing work of Nature, its rough and rugged sides giving alternately light and shade, and its bright snow-white cap a brilliancy and effect that no pen can describe or artist paint.

"Who can paint like Nature?"

Our steady-going steamer delivered us safe and in good condition at Vera Cruz, a city as remarkable as Havana for being the graveyard of Europeans.

Vera Cruz has no harbour, — nothing but an open roadstead; and no shipping can lie safely there during the season when the destructive "nortes" prevail, viz., from October to February or March. It is rather strange that being the principal means of ingress and egress of trade for a large territory like Mexico, no attempt has been made to form a harbour there, or even on the coast to the south of Vera Cruz (San Antonio), where there is a good natural harbour, which is much frequented by shipping when the "nortes" are expected: at the time of my visit, the French and English men-of-war were lying there.

Vera Cruz appears a small place from the harbour; its approaches are strongly defended by a fort called St. Juan de Ulloa, mounting many guns to the west, on an island, and another fortification to the north, besides a strong loop-holed wall along the beach for small arms.

There is a mole projecting out some distance from the shore, which serves as a landing-place for passengers and merchandise; but the swell is so great sometimes that boats are swamped alongside.

The custom-house, a capacious building, is immediately at the end of the mole, through the gates of which you have to pass to enter the city.

Vera Cruz is situated very low, very little above the level of the sea, and on examination is a much larger place than it appears: it is well and regularly laid out, the streets running east and west and north and south, crossing each other at right angles; they are tolerable wide, well paved, and with good side-paths. The drainage runs upon the surface, down the channels in the centre of the street.

In the centre of the city and nearly opposite the Mole, is the Plaza des Armis, a square of considerable extent, on one side of which is the Diligentia Hotel, on another the cathedral, on another the court-house, and the other is occupied with stores. This square is enclosed from the streets with a dwarf wall, around which seats are placed, and the middle is laid out ornamentally, and planted with the bright and gorgeous flowers of the country and ornamental trees. At night it is brilliantly lighted up.

The city, when I was there, was garrisoned with Egyptian troops, who wore the peculiar white costume of the East: they are fine soldiers, and much dreaded for their ferocity by the rebellious Mexicans; in the evening sometimes their military bands play the wild and thrilling airs of their native country, which are full of most sweet music, and attract all the beauty and fashion of Vera Cruz. The principal public buildings consist of a cathedral and some churches in ruins, the court-house, a handsome building of Spanish arcaded architecture with a lofty campanile at the north end, a custom-house, baths, nicely fitted up and lined with porcelain, and a railway-station in course of erection.

The cathedral, though of rough exterior, is magnificently fitted up and embellished in the interior, which I shall hereafter describe in speaking of Cordova, as nearly all the Roman Catholic cathedrals resemble each other in arrangement and finish. There are many fine houses and stores in the city, two or three stories high. As in this part of Mexico they are not much affected with earthquakes, many of them are erected in the fronts on pillars and arches, so that an arcade is formed in front, at the back of which are the stores; in other parts there are no arcades, and the stores abut close up to the sidepaths of the street.

The former style of building is very suitable and convenient, as it affords a place of shade from the sun, and of shelter during the rainy season. The houses have mostly flat roofs, which they use for various purposes, such as drying clothes. The walls of the houses are built of small rubble masonry, into which flat red bricks are introduced at intervals for bond, and they are afterwards finished off with plaster; the fronts of some of them are very much ornamented with plaster pilasters, capitals, mouldings, &c., and even colour is introduced to produce effect. Many of the houses have ornamental balconies, verandahs, and jalousies.

Vera Cruz, like the city of Havana, can boast of its street tramway: a line is laid down from the railway station, running through the principal street from north to south, and round the north end to the Mole: it is worked by horses and American cars. This tramway is found a great convenience, and is much used by the inhabitants. The city hitherto has been badly supplied with water, that necessary element of life having been brought in with mules in small casks; but at the present moment they are laying iron pipes for an improved supply, to be obtained from a river about ten miles' distance from Vera Cruz. The city is also well lighted with gas, which must be attended with considerable expense to the inhabitants, as they obtain their supply of coal from Great Britain.

Vera Cruz, also, like Havana, suffers from the terrible effects of its bad drainage, and is scarcely ever free from that destructive disease, yellow fever. After sun-down, and when the dew rises, if you go into the street, the olfactory organs are annoyed with a villainous compound of concentrated smells; so much so as to almost overpower you, and which frequently produces a disastrous effect upon strangers, rendering the place dangerous at such times to those not acclimatized. There is a capacious cemetery to the west of the city, as in most Spanish-built places, which contains many fine monuments, and appears from a cursory view to be crowded with the victims of this unhealthy place.

The "Alameda," to the south of Vera Cruz, is a very interesting promenade, extending to a distance of about half a mile: there is a level wide pathway which is formed of small rubble stone smoothly plastered over, and a dwarf wall is erected on each side as a boundary, and which is widened in a semicircular form at intervals; along this wall numerous seats are placed, and at the back the grounds are planted with the gay and brightly tinted flowers of the tropics, and ornamental trees. The fashionable world of Vera Cruz does not make such a showy and grand display of carriages as opulent and purse-proud Havana; but it is equally distinguished for equestrians, the Mexicans being bold and skilful riders, and proud of their showy dress and horsemanship. The temperature of Vera Cruz is generally very high in ordinary seasons; the thermometer ranges from 80° to 90°, and frequently reaches as high as 105° in the shade: this high rate of temperature renders the air of the city very oppressive at times, and this is much aggravated by the high sand-banks which are thrown up by the "Nortes" to the north of the city, totally excluding the cool and refreshing sea breezes.

As Mexico is just now emerging from half a century of anarchy and misgovernment, and opening upon a new era under a singularly gifted, enlightened, and benevolent Emperor, it is to be hoped that the public health will form one of the primary objects of Imperial legislation, more particularly as emigration is required to consolidate and strengthen the foundations of the new empire, and to open up the vast resources of the country, which have never yet been developed: the unhealthy character of Vera Cruz and other places in the "Tierra Caliente" is so proverbial that few emigrants will venture their lives on the hazard of such a die.

If the regeneration of Mexico be seriously contemplated, it is only to be effected by the infusion of new blood, and a more active and vigorous race of people. The climate in many places is so very enervating, that the descendants of the ancient conquerors of the country are become seriously degenerated, indolent, and demoralized, and totally unequal to the emergency of Mexico resuscitating, Phœnix-like, from her ashes, through their instrumentality. Many French, Germans, and Americans have expressed an intention of becoming permanent settlers there, provided the Government is strong enough to protect their property and persons, to properly administer the laws, and to govern the country. In drawing attention to the professional works in Mexico, one of the first and most important subjects for the future of that country is, I think, the Imperial Mexican Railway, a line which has been in course of construction for some years from Vera Cruz to Cameron, by capitalists in Mexico, under the professional advice of American engineers, but which languished for the want of funds to prosecute the works, until the invasion of Mexico by the French rendered its extension necessary in a military point of view, and they undertook to carry it out from Cameron to Paso del Macho, a distance of ten miles, and apply the revenue received from the customs at Vera Cruz to pay the expenses; but finding that inadequate to prosecute successfully and with vigour so large a work, a company of capitalists was formed in England, under imperial auspices, to carry out the line from Paso del Macho to the city of Mexico, with a branch line to Puebla.

This railway (a single line) was originally designed and laid out from Vera Cruz to Orizaba, a distance of about ninety miles, with a capital of one million sterling; it was afterwards surveyed and extended to the city of Mexico, with a branch line to Puebla, with the intention of ultimately extending it to the Pacific Ocean, so as to unite the two seas together. It is 300 miles long, with a branch of thirty miles to Puebla. The capital of the proposed line is now extended to 5,400,000*l.*, or nearly 16,000*l.* per mile, with a concession in perpetuity and a subvention of six million dollars from the Imperial Mexican Government, the exclusive right of constructing any branch line within sixty miles of the main line, importation of all materials used in the construction, rolling stock, &c., duty free, and other advantages, which place the line in a favourable position in a commercial point of view.

The contract for the work was taken by Messrs. Smith, Knight, & Co. (Limited), but I see has recently been transferred to Mr. Crawley, for the sum of 5,239,120*l.*, to complete the works, purchase the land, and provide stations, rolling stock, &c., and remodel those works already imperfectly done; and the engineers are to have 180,000*l.* for laying out and superintending the works of the line, which amounts to a little in excess of the capital; but there is no provision for extra charges and prices which are sure to arise in the execution of such an extensive work.

The line of railway already opened commences at Vera Cruz, and terminates at Paso del Macho, passing Solidad, Cameron, and some Indian villages a distance of fifty-three miles.

This part of the line has been laid out on the American system of engineering, and the whole works have turned out a miserable failure,—short chopped up gradients, following nearly the undulations of the grounds, sharp curves, light works, bad drainage, no ballast, bad permanent way; in fact, all the objectionable principles of American engineering are fully exemplified on this short line; and the railway was so rough in travelling over that you had great difficulty in keeping your seat,—in fact, it is almost as rough as the tossing about of a boat in a rough seaway. I will shortly describe the mode of executing the works. The earthwork is generally done by running a greater part of the cuttings to spoil, and going into side cuttings to make the embankments; and this is done to lessen the lead, or the "haul," as the Americans term it, and therefore the expense; and may answer very well where land is of little value, as it is there, although very productive. But in England the cost of land required for such a system would be ruinous, as more than double the quantity is required for the line, slopes, &c.; and, if the cost of land on the average in England for the railways has been about 5,000*l.* per mile, it would be upwards of 10,000*l.* per mile if such a system were adopted, or more than the total cost per mile of many single lines of railway as executed now, since more care is used, and a spirit of economy is infused into the management of them.

The cuttings and embankments are laid out too narrow, being only 16 ft. wide for the upper works, and nothing extra taken for drains, &c. The permanent way is generally laid on transverse sleepers, with the rails spiked down to them. There are no chairs to receive the rails, or other arrangement to prevent the rails from being forced by the weight and concussion of the traffic into the sleeper; and there are no fish-plates to hold the joints of the rails together, and this may account for the American system of railways so frequently getting out of order, and the many serious accidents that occur.

On the part of the line that is opened from Vera Cruz to Paso del Macho, no ballast is laid on to receive the permanent way. The sleepers are merely placed on the ordinary earth, whatever might be its geological character. No gravel, broken stone, burnt clay, or other material is used to form a dry solid bed for the upper works; and the surface formation being frequently soft, plastic, yielding clay, the sleepers sink into the soft subsoil, and the effect in travelling is a rolling tumbling motion, most unpleasant to experience, reminding one, as I have said, of a boat in a short chopping sea.

B. B., C.E.

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LEEDS TOWN HALL.—We are told that the Leeds Town Council have commissioned Mr. W. D. Keyworth, jun., of London, sculptor, to execute, in Portland stone, four colossal lions, to adorn the front of their town-hall.

## THE "NORTHUMBERLAND" LAUNCHED AT LAST.

AFTER a month of peril and expense this noble vessel is at last safely afloat. The launch was hailed with an enthusiasm which was the more lively from the circumstance that the event, which so many thousands witnessed, had in it, after all, something of the nature of a surprise. So great was the difficulty to be overcome, so late were the preparations before they were completed, and so far from favourable were wind and tide, that the general impression was that the disappointment of Monday would be repeated on Tuesday, and that the fine, clear outline of the iron hull would remain high above the surface of the Thames.

The officers in charge of the launch have succeeded in their hazardous task by acting on the rule which we pointed out of having adequate, and more than adequate power at command. This they have happily effected, not by lightening the vessel, as we at first suggested, and as the *Examiner* more lately urged, but by the employment of camels, or large pontoons, built expressly to fit the keel of the *Northumberland*, and giving a lifting power of some 1,600 tons in addition to the buoyancy of the vessel herself. The difficulty of applying such additional flotage was shown almost at the last hour, by the failure to fix one of the largest camels, which caused the postponement of the attempt on Monday; but once securely fixed, the amount of buoyancy would, of course, be matter of exact calculation, and the work to be done by the hydraulic rams in pushing forward the cradle was thus brought within the limits of practicability. Slowly the mighty mass yielded to the effort; but, even when once afloat, fears were for a time entertained lest the steam-tug power employed was sufficient to prevent the great iron-clad from drifting ashore.

One engineering lesson of great importance may be deduced from the launch, or rather from its long delay. We can now put our finger with certitude on the cause of the accident. It might have been predicted with great probability by any mechanic whose attention had been called to the fact that the ways were laid at two inclines, so that there was an angle about half way, at which angle, very naturally, the great superincumbent weight caused the cradle to nip the ways, and the launch to be suspended. It is true that this angle was not an actual ascent, but a change from a flatter to a steeper gradient, from one in twenty-four, or about half the usual pitch, to one in thirteen. But it must be borne in mind that in passing over this angle, the keel would cease to be uniformly borne by the ways, the difference in the pitch being such that, taking the ship as half way over the point in question, if the bows still rested on the ways, the stern would have left them by not less than 20 ft. However the cradle might adjust itself to such a difficulty, the formidable obstacle thus caused to the launch is obvious, and the additional pitch of the outer half of the ways has been the real cause of the hitch in the launch of the *Northumberland*, unduly and unnecessarily as that risk was augmented by plating the vessel before launching to her full and enormous weight.

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## THE ELM.

IF we were asked to name the most popular and well-known of British trees, the answer would certainly be the elm (*Ulmus campestris*); for this there are many reasons, and the principal one perhaps is its being so constantly planted near towns and villages as to be known (by sight, if not by name) to all. In parks, gardens, and road-sides, it is planted all over the country, and is at once known by its lofty, upright, and graceful growth, though often attaining an immense size, it seldom possesses the rugged and grotesque beauty of the oak or the yew; all its branches generally tend upwards, dividing and sub-dividing as they reach the summit, where the smaller branchlets form a dense mass: the tree does not lose this character even in winter, when the branches are quite leafless. It is in this intricate mass of the smaller upper branches that some birds so especially love to nest, and every one familiar with certain elms will remember how the nests gradually became apparent at the fall of the year, after the first autumn storms had swept away the leaves. The bark is rugged and irregularly incised, closely resembling the oak; the leaves are small in comparison with the size of the tree, one specimen having been estimated to produce seven millions of leaves, sufficient to cover a space of five acres: from their one-sided growth (like the well-known *Begonia*) they are puzzling alike to the naturalist and the art-student. The leaf-buds of the elm in early spring are particularly small and of a very delicate green. The beauty of the tree in April, before the leaves are fully out, is incomparable, particularly when seen in masses, such as occur in avenues in parks and in situations where they are planted in dense clumps. The flowers grow from the old wood, and are fully out before the leaves appear, forming crimson pendulous clusters of great beauty, but not being very conspicuous, are generally unheeded; the fruit is flat and leaf-like, bearing a single seed in the centre: this is not so commonly seen as is the flower. Many forms and varieties of this tree, more or less common in this country, have been described as distinct species, and there is considerable confusion as to whether certain supposed characters are really distinct and permanent or not: it is one instance among many where man tries in vain to draw a boundary line between a species and its neighbours. Some systematic botanists are, however, content to recognise all the forms as naturalised in this country under two heads, viz., the one under consideration, common in central and southern England; and the form known as the wych elm (*U. montana*), a smaller tree with larger leaves, common in hilly districts in Scotland and northern England; some competent authorities even cut the gordian knot by grouping them all under one head by the name of common elm, of which the wych elm is to be considered a variety (this does not include the American and the so-called Spanish elm of Jamaica).

The common elm, the plant of our parks and roadsides, is a native of the western districts of Asia, and of eastern, central, and southern Europe. It has been supposed, with good reason, on these grounds and from the fact of its seldom producing fruit in Britain, not to be a native of this country, its presence being due to introduction in distant times; it is, therefore, not found in a native state here in woods and forests, but is generally confined to the neighbourhood of man's abode, where it has been planted.

It is not particular as to soil, and is of rapid and vigorous growth, producing in a short time timber of great value for building purposes. During the process of seasoning, it, however, loses much of its bulk and weight, when it becomes little affected by wet; and for this reason it has been invariably selected for damp situations. Its generally very straight stem rendered it fitting for the old water-pipes, for which it was much used. Keels and the submerged parts of vessels were at one time invariably made of it. It is generally selected for use in the piles for bridges and similar structures, for coffins, and for numberless other purposes, where endurance in a wet situation is required, and where the wood of other trees, if as good for the purpose as elm, is not as readily and cheaply procured. The variety or species known as wych elm is believed to be truly indigenous to this country, where it constantly matures its seed; its general character is different to the common elm; the central upright stem being lost in this species, and the branches are inclined to droop, the leaves are much larger, and the timber it produces is sound and tough, but said to be inferior to the common form. The gnarled and knotted excrescences are much used by cabinetmakers for fancy work.

The elm is somewhat deficient in direct historical associations and classical allusions: although many references are made to the tree by poets and historians, ancient and modern, the statement that the tree was introduced to this country by the crusaders appears to be wholly without foundation; other unimportant associations of the tree we will pass over.

The peculiarities of its branching and leafage are readily caught by the artist, and for this reason it may be said to occur in nearly all landscape compositions, from the finished picture of the mature artist, to the meaningless scratch of the illustrator of "Mokeana," in a halfpenny magazine. The elm-tree is pressed into service by artists of every grade, and when pictures of *fêtes* and sporting views are given in the illustrated papers, the trees figured are invariably elms; the mannerism of one artist is so repeatedly copied by another, and his by a third, that the

poor elm-tree, as pictorially represented, often becomes quite a conventional object.

Where the elm-tree grows *there* may be found its numerous parasites: flies, beetles, moths, butterflies, caterpillars, and fleas abound in every part of it: some do a great deal of damage, and others very little; some are quite peculiar to the tree, whilst others are more cosmopolitan in their instincts. These creatures all suggest themselves as fitting companions for the elm, with its one-sided leaves and crimson flowers, when it is desired to introduce it as a decorative object.

When the autumn winds rush through its trembling branches, and its bright yellow leaves are driven hither and thither by the wind, a large and singular parasite often takes up its abode towards the top of the tree, generally in some hollow place, or on a wound where a branch has been snapped off—this is *Agaricus ulmarius*, so called from its attachment to the elm-tree only; it usually takes the form of a large massive group of white mushrooms, that are well known to be esculent, but generally out of the reach of man. They are of rapid growth, disappearing with the frosts of winter, and reappearing in the following early autumn. This parasite is said to be uncommon in some districts, but is generally abundant enough in St. James's Park; last and many previous autumns nearly every elm within a quarter of a mile of the Horse Guards bore one or two fine large groups of these large edible excrescences.

One of the most singular of all vegetable growths, the "Jew's-ear" (*Hirneola auricula-Judæ*), although not altogether peculiar to, appears frequently on the trunk of, the elm-tree. It is not confined to the living tree, but will at times appear on elm stakes and gate-posts. In its early state it does not always take the precise form of an ear; but when well grown it presents an exact counterpart of a human ear, the folding and undulation and the delicate veining are exact duplicates of the ear of man. The substance is dusky, downy, soft, and flesh-like, and is in every way a precise and startling transcript of the human original. The "Jew's-ear" has been well known from very ancient times, and was at one time, and is in some places now, supposed to possess magical curative powers. It is still an article of commerce, and sold in some markets, both at home and abroad.

Perhaps more common than the above, and appearing in the autumn on the trunks and fallen branches of this and other trees, is *Tremella mesenterica*, so called from its close resemblance to the human mesentery. In olden times these objects sadly puzzled our forefathers, who considered them as belonging neither to the animal nor the vegetable kingdoms, and looked upon them with awe and suspicion, as possessed of occult power, and as productions of witchcraft and magic.

W. G. S.

## FEVER IN LONDON: ITS LESSONS.*

THE deaths from this cause in London from 1851 to 1860 were 21,870, and in the four following years, 11,990. These represent about 290,000 cases of fever in the fourteen years, chiefly among the poorest. Of course, they represent poverty filth, misery, and a great cost to the paying classes,—a cost not easy to be calculated. You must know, also, that these cases have been increasing. The annual average from 1851 to 1860 was 2,187; from 1861 to 1864, 2,992. This, at the lowest calculation, is an average annual increase of 6,500 cases of fever in the latter period over the former in London alone.

If any disease may be said to be *the test* of the sanitary neglect of a locality, fever in its various forms is essentially that disease. As surely as we find fever year after year breaking out or continuing about the same spot, so sure is work to be done there, and there is a very reasonable ground for believing that, with prompt, good, and appropriate work, the disease may be banished, or very nearly so. One of my earliest sanitary lessons as a parish surgeon was this:—I had one house that specially teazed me: this was before the vestry days. Every fresh occupant was nearly sure to have fever. This went on year after year, and cost the parish very much money, and the poor many a life; it also created a few paupers. Now and then the house was partially cleansed and fumigated, especially after a new case had been taken to the hospital. People said, "See, now, cleansing and white-washing will not prevent it; it comes from the habits of the poor." One said drunkenness, another dirt, another Providence; but, as a partial and superficial cleansing will not banish fever, I was at length tired of it, and recommended emptying the house and thoroughly cleansing it from top to bottom, with due attention to drains, water-butt, &c., and keeping the house empty for three or four weeks. It was done; and the house was from that time for years after, as effectually cleared of fever as if none had ever been there. I mention this because it is a typical case. Dr. Jeaffreson is very clear upon this in his advice to the sanitary authorities. Speaking of cases from my own parish, he said, "The facts most prominent in relation to these cases were that they came continuously month by month from the same buildings, or building, even. This was explained by the fact that eight or ten cases had been sent to the Fever Hospital, and the premises still remained overcrowded and filthy. The sick were removed, and the healthy were at once admitted to the infected rooms, to catch the disease in their turn." He says, "If infected rooms were scrubbed and limewashed from top to bottom, and kept empty afterwards for not less than ten days, there is no doubt they would become safe habitations, provided decent sanitary regulations were afterwards enforced." This is my experience. In my earlier time, before the Lodging-house Acts were in force, one of the hotbeds of the disease was the common lodging-house. In my later time, after the Acts got into operation, it became more and more rare to find infectious disease, especially fever, in them; and, when brought in, the by-law of prompt removal, cleansing, and keeping empty, effectually prevented the spread of the disease. Fever, in the opinion of a great French authority, is an artificial disease, and may be produced or destroyed at will; and in the opinion of those who are best acquainted with the subject, he is not far out. The prison records of Howard's time show how it may be produced, and Howard's work shows how it may be destroyed; and the Lodging-house Acts which are really carried out tell the same tale in a less marked manner. Mr. Simon's words are as remarkable as they are true. "Fever is essentially a disease of filth. True, a few deaths cannot be accepted as a conclusive proof of sanitary neglect in the district where they occurred; for unavoidable contagion may have been imported. Even the fatal cases themselves may have come from a fever-nest in some adjoining jurisdiction. But I do not hesitate to say that the registration of any fever deaths in a district not suffering from famine is a thing which, for the credit of the local sanitary authority, ought to be susceptible of some such application." And here let me note well the words, "imported from some adjoining jurisdiction." You will at once see how little it avails for one parish, or district, or street to be clean and wholesome, if gross neglect and consequent infectious and putrid disease are common in another district, parish, or street not far off. And this points as strongly as any argument can, if not for some central great power, at least to some sufficiently authoritative court of appeal. Dr. Greenhow notes in some places an annual average death-rate from fever of 21 in 100,000, and in other places running up to 204, 207, and 209. Such facts require special and authoritative investigation, and the Blue Books of the health department of the Privy Council give instances of such special investigations. The power to deal with them is yet to come. It is of importance to note the age at which people are stricken down by this disease. The majority are of those who have had time to become useful, at a time sufficiently advanced to repay some of the trouble and cost of their earlier time. In this economical sense it is peculiarly unfortunate if we let fever go on. Of 2,497 cases admitted into the Fever Hospital in 1864, 510 were under fifteen, 1,720 from fifteen to fifty, 267 over fifty. See also how it concerns the parishes. The "poor ratepayer" has become a sort of proverb, ever in the mouth for obstructive purposes when any good was to be done, if that good was to cost money. The ratepayer is likely to be poor when he is surrounded by typhus and its miserable concomitants and associations on the one hand, and on the other hand governed by persons who see so little before them that they fail to see how much they might save and how many they might save by damming up or stamping out such diseases. In a given number of patients admitted at the Fever Hospital, 215 were domestic servants or policemen for whom fees were paid; 71 were admitted free, but 3,324 were admitted by parish orders. This shows well enough where the seed is, where the nesting is; and it shows well enough that it is essentially a Poor-law question; and now, while the Poor-law is before us, in connexion with fever, let me tell you how it does, or, rather, how it does not, provide. Impressed with the prevalence of fever in my parish, as a guardian, November, 1863, I moved the following resolution: "That the clerk write to the district medical officers, and request that they will be pleased to send weekly to the Board, in writing, the name and address in the case of every parish patient visited at his or her own house, where, in the opinion of the medical officer, the bad state of the premises stands either as the cause of disease or as retarding recovery." This was carried unanimously enough; but as the Poor-law does not provide clearly for this innovation, it soon ceased to be acted upon. I further urged that, in the weekly return of the medical officers, under the Poor-law, it would be sufficient to underline every address of a house with conditions like those comprised in my resolution, so that the attention of the health officer might be authoritatively and promptly drawn to the spot. It was further moved in the sanitary committee of the same parish, "That each case reported in the death-register as typhus shall be specially reported upon at each meeting of committee, such report to comprise the condition of the premises, rooms, number of inhabitants to each room, probable causes of fever when ascertainable, and measures taken or suggestions made for preventing the extension of the disease, and such other particulars as the medical officer may think necessary."

This resolution the committee refused to adopt, and since that time there have been more than 2,000 cases in the parish.*

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Until we have compulsory power for sound, effectual, and prompt work in the homes of the poorest, compulsory power to purchase sites covered with houses, poisoning and making poor their neighbourhoods, and in themselves unfit for human habitation, so long will our poorest be producers and propagators of disease, uneducated, irreligious, immoral, and I may say brutal. So long will they not only themselves rely on poor-rates, but they will bequeath to us their children after them.

In conclusion, let me in a few words note some of the requirements which come out of the consideration of my subject.

I deplore the frequency with which the public ear and the vestry ear are filled with accounts of difficulties, — of impossibilities, as they are called. Our first duty is, where there is so much to be done, to attend to the multitude of matters which are possible, and, while doing so, we shall learn to diminish the list of the "impossible."

We must have better and healthier homes for the poorest classes,—not the palaces designed by philanthropists, with appliances which do not often come within the means of the lower middle class, but cheap, wholesome, and suitable places. It is manifest that the very high prices paid by these people for their miserable homes is enough to pay profitably for better places. The authorities of the poorer localities would display great economic wisdom in getting and using public money at 3½ per cent. for this purpose; and in the construction of such houses the local authority should possess far greater power to insist upon all reasonable health conditions.

All houses let to weekly tenants should be registered, and brought, by means of by-laws sanctioned by a central authority and administered by the local, into some kind of resemblance to the management of the common lodging-houses. This may be done with due regard to the rights of a man in his home.

Places are required into which poor tenants unaffected with infectious disease can be removed when they can find no other during the cleansing of an infected house.

Local hospitals with plenty of ventilation and air-space for the reception of those infected by disease.

Better nursing for the sick poor, and a better mode of supplying the prepared necessaries in sustenance during illness.

* From a paper by Mr. W. Rendle, surgeon, read at a meeting of "The Metropolitan Sanitary Association."

* Our own exposure of the abominable condition of parts of this parish,—St. George's, Southwark,—will be remembered by our readers.—ED.

Information without any delay to the sanitary officers of cases of infectious disease, and of premises and conditions likely to give rise to the same found in the visits of medical officers and inspectors under the Poor Law.

Alterations of the Poor Law, so far as all these matters concern, as they generally do, persons in receipt of parish relief.

Power for prompt action to remove infected persons from filthy and infected houses, or in cases where there is danger of infection to others.

The change of some of our laws which are permissive into laws obligatory; the permission to act being most usually construed into permission not to act.

When it is important to do sanitary work, and it is the duty of the local authority to do it; in case of dangerous delay or neglect, that a central power might on appeal come in and do it, and charge it to the local authority.

## THE TRADES MOVEMENT.

*London.*—The Master Builders' Association, comprising nearly the whole of the leading firms, held a meeting on Wednesday in last week, at which the notice of the masons and joiners that they would require 8d. an hour, instead of 7½d., by the 1st of May, 1866, was taken into consideration, and a sub-committee of six members appointed to effect some arrangement of the question. On Friday evening last, Mr. George Myers, of Lambeth, who is a member of the sub-committee, sent for deputations from the masons and joiners in his employ, and asked them whether, provided the extra 0½d. per hour were granted, the men would agree to work one hour less during the winter months on all out-door jobs and unprotected buildings, the time for working in the shop to remain at ten hours all the year round. If the men agreed to this, he was prepared to recommend that course to be taken by the masters generally at the meeting to be held on Monday. Shop meetings of the masons and joiners were therefore held on Saturday, when the proposal of Mr. Myers was submitted for consideration, and accepted by a large majority of the men. The result was at once communicated to Mr. Myers, with the understanding that a general meeting of the delegates of the carpenters and joiners would be held on Wednesday, to receive the reply of the employers. Favourable replies having been received from Messrs. Cubitt, Smith & Taylor, and Myers, the meeting referred to, after a long and protracted discussion, passed the following resolution, out of several proposed, by an overwhelming majority:—"That we accept the proposal of the master builders of 8d. per hour, with the condition that the time of nine hours per day be worked both in shops and on out-door jobs, from the 9th of November to the 14th of February." This resolution was then ordered to be conveyed by the delegates to the employers. An adjourned meeting will be held to hear the result, which, it is anticipated will be favourable.

*Gloucester.*—The masters of the carpenters who are on strike here have held two meetings, but they will not concede the hour asked for by the men. It is said with some firms the working time is less than that now demanded; and the men on strike say if they yield, an injustice will be done to their fellows.

*Exeter.*—The journeymen carpenters at Exeter, and two or three other places in the West of England besides Gloucester, are out on strike, in consequence of the masters having refused to accede to the demand for an advance in the weekly wages, of 3s. The average pay at present is 21s. The Amalgamated Society of Operative Carpenters and Joiners have agreed to allow every man on strike 12s. per week.

*Newport.*—The journeymen carpenters of Newport have struck for 6d. per day advance of wages, which the masters have in some cases conceded.

*Leek.*—The joiners in this town are now out on strike for an advance of wages and a reduction of the hours of labour, the notice of four months which they had given their employers having expired.

*Manchester.*—The stonemasons have for the last twelve months been agitating for various little "reforms" in connexion with their own trade. These include an advance of 1s. per week on the wages, which are 32s. in summer and 29s. in winter,—the Liverpool stonemasons having already obtained a similar increase; a reduction of one hour in the working time on Saturdays—so that the men shall leave the yards at twelve instead of one o'clock; an allowance for walking time beyond certain defined limits in going to work; and an increase of 3d. per day when working on hard stone, as a compensation for the extra wear and tear of tools. The men gave notice to the masters six months ago of their intention to turn out unless their wishes were complied with. An intimation was lately received that the masters would only grant the extra shilling asked for, but this offer was rejected. Finally, the masters also gave up the hour on Saturdays, but would yield no further concessions. About 500 stonemasons assembled last week to consider this proposal; and, after considerable discussion, it was agreed to accept the offer of the masters, and to let the other matters remain in abeyance, as well as another disputed point relative to arbitration, which the men are averse to, preferring to settle all questions of difference with the masters themselves.

*Jarrow.*—On Tuesday, in last week, a meeting of workmen was held, to consider the question of the nine hours movement, and to hear the result of sectional meetings held among the men of Messrs. Palmer & Co.'s ship-building works. An *employé* of Messrs. Palmer presided, and said he was glad to state the unanimous opinion of the sectional meetings was against a strike. A report was read about the movement on the Clyde and other large ship-building yards in Scotland, which stated that the masters had reduced the labour two hours per week, making the time 57 hours. A resolution to the effect that a deputation should wait upon Mr. Palmer, to inquire if he would accede to the 57 hours, and pay their wages weekly, instead of fortnightly, was carried.

*Newcastle and Gateshead.*—The operative stonemasons are on strike for a reduction of their hours of labour from ten to nine hours per day during five days in the week, and a half-holiday on Saturdays, or 50½ hours per week. The men have been working ten hours per day during five days in the week, and have enjoyed a Saturday half-holiday since June last. The masters offer to pay the men 6½d. per hour, which will yield them 1*l.* 8s. 4d. per week in summer, and 1*l.* 6s. in winter, provided they work whole time. They, however, refuse to accept it. The nine hours agitation in the iron ship-building yards is about at an end on the Tees and at Hartlepool, as the masters have been able to fill the yards with non-union men. The ship-joiners usually employed in the iron ship-building yards of the Tyne remain out on strike for reduction of their time to nine hours; but the masters are determined not to concede it, and they are getting their joiners' work done at other parts.

*Edinburgh.*—The labourers' strike continues, and most of those in union have got employment elsewhere. The Masters' Association have offered 4d. an hour on certain conditions, but the offer has not been accepted.

*Galashiels.*—The journeymen masons have resolved to demand a rise of wages to 6½d. per hour. A deputation from the meeting waited on the master builders, who readily granted the request.

*Falkirk.*—The employers have agreed to give the operative slaters 5d. per hour, which the men, in the mean time, have accepted.

*Coatbridge.*—The miners here have been on strike, but the masters have given in to their demand for an advance of 6d. per day of eight hours, and in consequence the price of coal has been raised 1s. 5d., and in some instances 1s. 10d., per ton. The Ayrshire miners are also agitating for a rise of wages and threatening strikes, as in many other branches of industry throughout Scotland.

*Crieff.*—The demand recently made by the masons for an advance of ½d. per hour has been granted. The rate now is 5d. per hour.

*Aberdeen.*—Upwards of 150 joiners yet remain out on strike. A committee of operatives offer to take work on their own account, preparatory to a co-operative company being formed. About seventy of the house-painters are also out on strike. The demand made by them is for an advance of wages 3s. per week, and the masters have agreed to give 2s. The strike is only a partial one. A disgraceful affair, arising out of the present strike among the house-carpenters and joiners, has just occurred. Mr. Rainnie, builder, had agreed to give the advance of 2s. per week asked by his workmen, but refused to sign any document to that effect, as requested by the committee of operatives. Mr. Rainnie's workmen resumed work, but a messenger was sent to him asking a written statement regarding the concession he had made to his workmen. This he again declined to give, and when the workmen were leaving for the day, they were surrounded by a great crowd of brother workmen and others, and pelted with missiles. This continued for a considerable time, the men who had returned to their work being struck and maltreated unmercifully. Fortunately the police were soon on the ground. This mode of intimidation has considerably damaged the position taken up by the carpenters in the strike.

## ARCHITECTURAL COMMITTEE FOR PARIS EXHIBITION.

THE endeavours to insure that the British Art Section of the Exhibition shall be properly and honourably represented so far as architecture is concerned are progressing satisfactorily. The British Commissioners of the Exhibition have confided to the committee the general arrangement and selection of the drawings and models which may be intended for exhibition. They have further placed at the disposal of the committee the large series of galleries at South Kensington, which are now occupied by the National Collection of Portraits, and have suggested that the drawings and models sent to the committee should be arranged in them, so as to form a Public Exhibition in London during December next. This is a very important suggestion, and it is to be hoped that the committee will be enabled to make this Exhibition one worthy of the country. It will, we suppose, include many works that will not be sent to Paris. The British Commissioners have agreed to take upon themselves the whole expense and the trouble of the various arrangements required after the drawings and models have been sent to South Kensington, and until their return thither from Paris; so that the expenses of the exhibitors will be limited to the cost of conveyance to and from South Kensington, and of any stands that may be required for models.

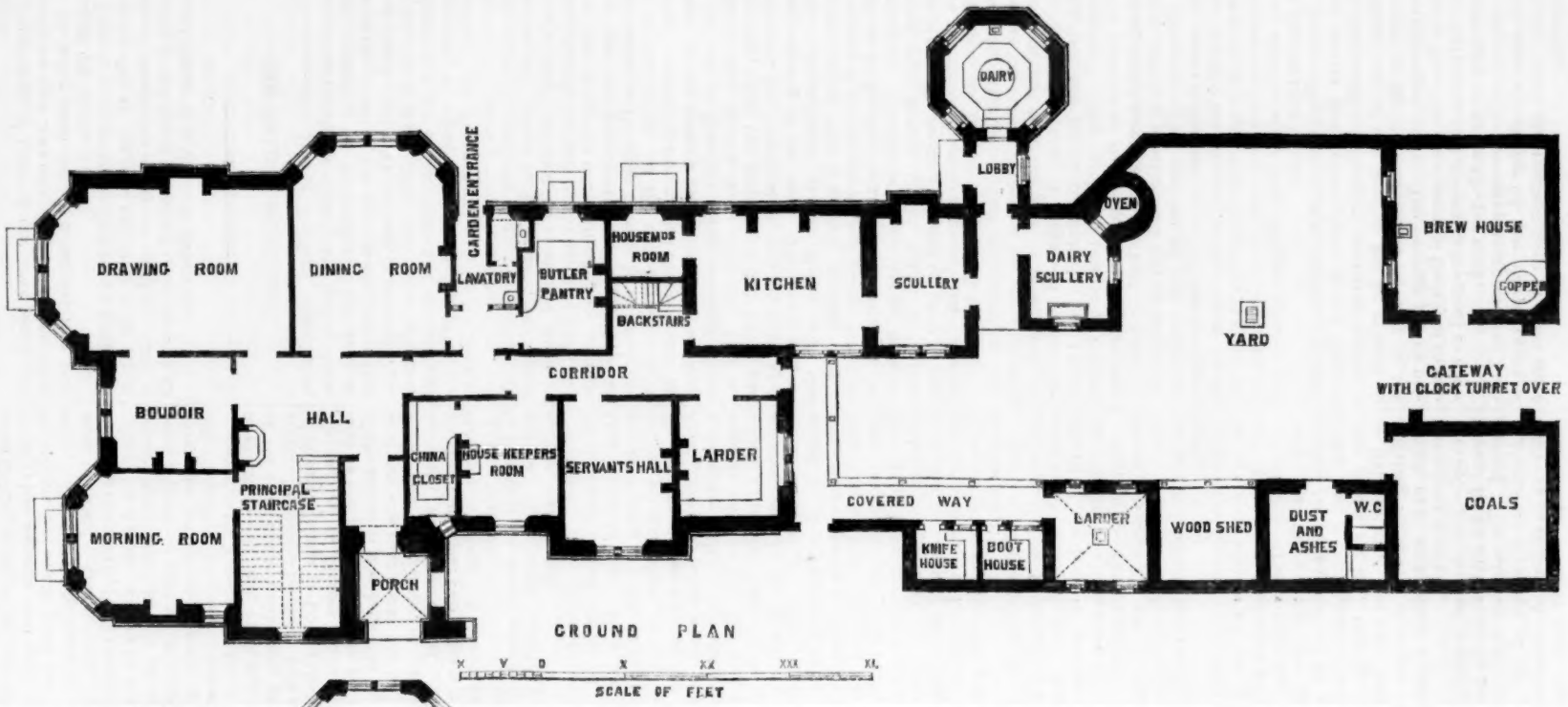
## BIGNELL HOUSE, NEAR BICESTER.

BIGNELL HOUSE, the residence of the Misses Drake, and of which we give illustrations, is built of a hard stone quarried upon the estate, the dressed work about the building being of Bath stone; the walls are lined internally with brick; the roofs are covered with brindle-coloured tiles.

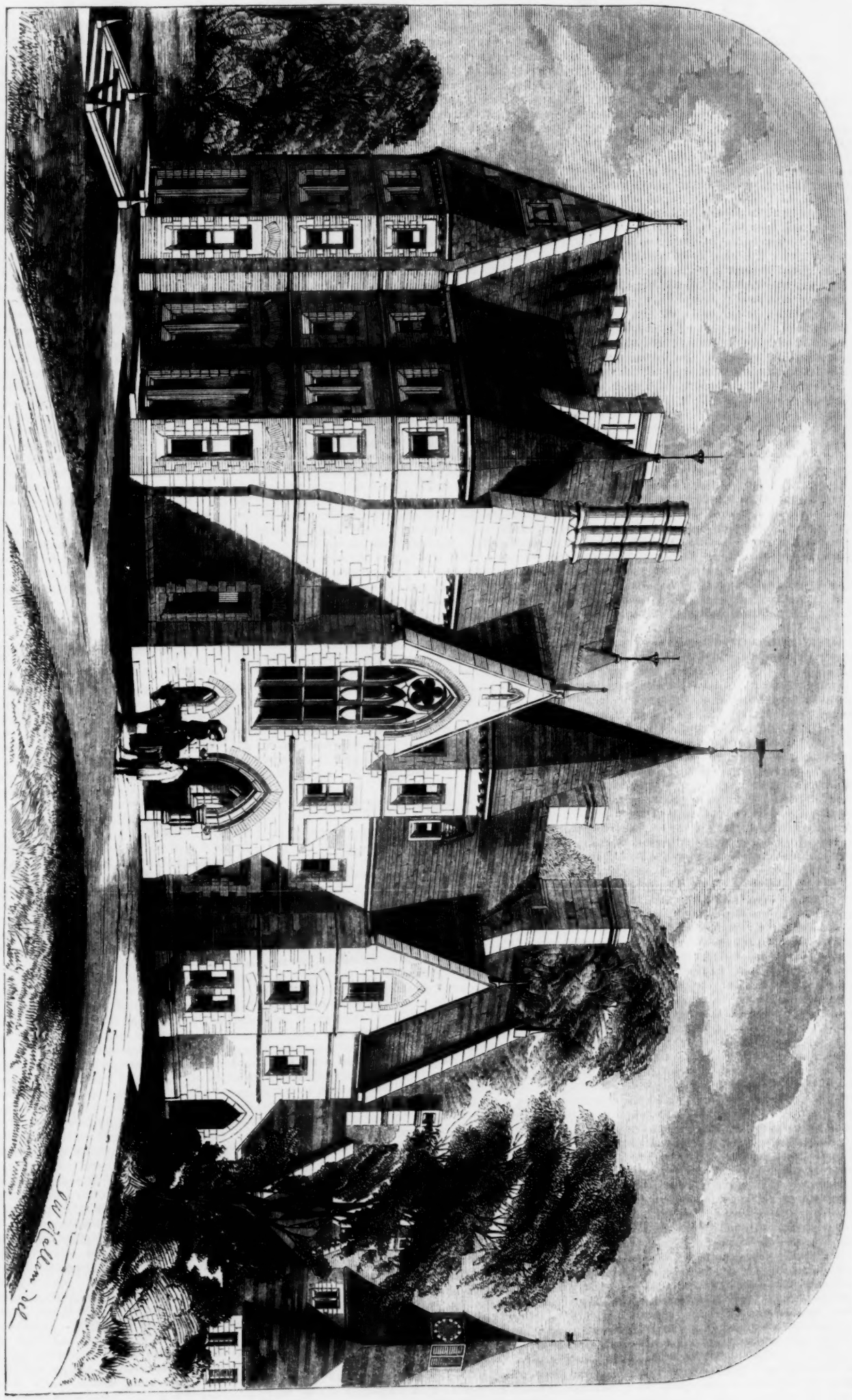
The entrance-porch is vaulted in stone. The floor of the inner porch is laid with ornamental tiles; and the floor in the hall is of oak. The staircase is constructed of wood, with cut balusters and wrought newels. The ceilings of the principal rooms and hall are constructed with girders and binders, moulded and stopped, dividing the ceilings into panels. These timbers, as well as all other woodwork in sight, are intended to be simply varnished. The kitchen has an open roof, with a lantern affording good light and ventilation. The kitchen offices are complete in their arrangement. There is a dairy, of an octagon form, distinct from the other buildings, although connected with them, and it has a private entrance from the lawn. The roof over the gateway to entrance to courtyard is surmounted by a turret, with a clock, which is visible from the entrance and garden fronts. The stabling, &c., occupy a site near the house.

Messrs. Orchard, of Banbury, were the builders, the work being carried out from the designs and under the superintendence of Mr. Wm. Wilkinson, of Oxford. Mr. T. Lewis was clerk of the works. The cost of the house, exclusive of stables and other additions, will be about 5,000*l.*

POISONOUS WATER.—"What killed Dr. Hodgkin?" says the *Medical Times*. "Impure water. We wonder that travellers do not carry with them a little bottle of permanganate of potass, a few drops of which would speedily purify any water. A friend of ours, who has just returned from India, tells us that he has derived the greatest benefit from its employment. In cases where the water was turbid, and tasting and smelling of decaying organic matter, the addition of a few drops of the solution of the permanganate made it in a few minutes as clear and sweet as spring water."




BIGNELL HOUSE.



BIGNELL HOUSE, NEAR BICESTER.—MR. WILLIAM WILKINSON, ARCHITECT.

## EAST LYDFORD CHURCH, SOMERTON, SOMERSET.

THIS new church was consecrated on the 4th inst., by Dr. Anderson, Bishop of Rupert's Town (acting for the bishop of the diocese, who was suffering from indisposition). It is built at the sole cost of the Rev. John James Moss, the rector (on a new site given by him), as a memorial of his late wife. The old church, which possessed no architectural interest, was in a very dilapidated condition, and quite unfit for use. Being situated in a low meadow, it was frequently liable to inundation; so much so, that during floods it was inaccessible. The plan of the new church consists of nave, chancel, and a bold south porch, with tower at north side of chancel arch. The latter is square at base, but changes into an octagon a little above the eaves' line, and is crowned with a spire about 100 ft. high. The general material of the wall is blue lias, the dressings being of Doulting stone; and the interior of the church faced with ashlar. The nave roof is covered with grey Bridgwater tiles, and the chancel with the local stone (taken from the old church). Over the window on the north side, at base of tower, is a sculptured *bas-relief*, containing an inscription written by Lieut.-General Sir Edward Cust, the father of the late Mrs. Moss. The font was presented by Mrs. Egerton, sister to the deceased lady. The chancel is fitted up with open benches of wainscot, and is paved with encaustic tiles. The cinquefoil window in the west gable of the nave is filled with glass by Hudson, of London.

The church is in the Early Decorated style, and was erected from the designs of Mr. Ferrey, architect, by Mr. Maurice Davis, of Langport, builder, at a cost somewhat under 3,000*l.*, and will accommodate about 150 persons. It stands on a beautiful plateau of grass, surrounded by fine elms, and is altogether very picturesquely situated.

## OLD CHELSEA CHURCH.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

AT a meeting, April 11th, Mr. G. R. Wright, F.S.A., in the chair, an interesting account of the Borough of Clickminin, in Orkney, the joint production of Sir Henry Dryden, bart., and Mr. J. T. Irvine, was read. It was illustrated with complete drawings of this very good specimen of a "Pict's House." Dr. James Copland added some particulars from his own knowledge of this building, and of two other "Picts' houses" in the Orkneys. Their resemblance to the nouraghis of Sardinia was also noticed. Mr. H. H. Burnell then read a paper, by the Rev. J. Blunt, with additions by himself, on the old church of Chelsea. A large part of Mr. Blunt's paper was reserved for the next meeting. Mr. Blunt suggested that the ancient dedication of the church was to All Saints, though it has long been appropriated to St. Luke. The chancel, with the chantries north and south of it, are the only portions of ancient work left. The north chantry, called the Manor Chantry, once contained the monuments of the Brays, now in very imperfect condition, having been destroyed or removed to make space for those of the Gervoise family. There remains, however, an ancient brass in the floor. Of the south, or More Chantry, he stated that the monument of Sir Thomas More was removed from it to the chancel, and the chantry had been occupied by the monuments of the Georges family, now also removed, displaced, and destroyed. The writer showed that, notwithstanding the current contrary opinion, founded on Aubrey's assertion, the More monument is the original one for which Sir Thomas Moore himself dictated the epitaph.

Mr. Burnell, the architect of the improvements effected subsequently to 1857, spoke positively as to the non-existence of a crypt which conjecture had placed under the More chantry. The foundation of the west end of the church, before it was enlarged in 1666, he found west of Lord Dacre's tomb. On the north side of the chancel an aumbry, and on the south a piscina were found, coeval with the chancel (early fourteenth century). The arch between the More chantry and the chancel is a specimen of Italian workmanship, dated 1528; a date confirmed by the objects represented in the carved ornaments, those objects being connected with the Roman Catholic ritual. It is a remarkably early instance of the use of Italian architecture in this country.

In a window of this chapel, then partly bricked up, were found in the brickwork, in 1858, remains of the stained glass which once filled it. The body of Sir Thomas More was, according to Aubrey, interred in this chapel; and his head, after an exposure of fourteen days,—testifying to the passers by on London Bridge the remorseless cruelty of Henry VIII., and his barbarous insensibility to virtue, patriotism, and talent,—was consigned to a vault in St. Dunstan's Church, Canterbury. It was seen and drawn in that vault in 1715.

## LEITH.

THE prosperous and increasing trade of this town is evinced by the additions which are from time to time being made to the docks and the business premises in their vicinity. The already extensive flour-mills of Messrs. A. & B. Tod, in Commercial-street, are in course of being greatly enlarged, and, with the additional accommodadation will, we believe, be the largest works of the kind in the kingdom. The present mills are constructed in the form of a triangle with a court-yard towards the street, and are worked by engines of 400-horse power, and twenty-seven pair of stones. The additional buildings are being erected in the court-yard, and will also be provided with an engine of 400-horse power and twenty-seven pairs of stones. The façade will have a frontage of 122 ft., of seven stories, rising to a height of 70 ft. The elevation will be imposing, and not devoid of architectural effect. The central portion of the building is slightly recessed, the windows having plain architraves, and the upper story is treated as an attic; on each flank are wings, with round-headed windows rising to an equal height with the two stories of the central portion, and at the angles are rustic quoins; these are surmounted by pilasters, with an entablature and pediment on the same level as the attic story. One of the wings is occupied by the engine and machinery on the ground-floor, and three stories of the other are to be used as offices; those wings are separated from the central portion by fire-proof walls. A grain and flour store are to be erected in the rear, which will rise to a height of six stories, and afford a floor-space of 14,000 ft.; it will have six cart-entrances, so arranged that carts can load under cover and pass from one side to the other without turning or backing. Messrs. Paterson & Shiells are the architects.

## ASSESSMENT COMMITTEES AND UNION VALUATIONS.

OF all combinations most inquiringly to be regarded — whether of persons, committees, or associations—none are more questionable in the moral effect they exercise over the body politic than a combination of those whose official transactions, under the guise and semblance of legality, operate speciously at least, or so as to impress the discerning mind with the idea that either willingly or wilfully their main effort and purpose consist in striving to misinterpret, evade, and circumvent the full and free operation of the law, the provisions of which, by statutory enactment, they were themselves appointed to administer, and for which purpose, as a legislative body, they were so constituted and called into existence. When, for example, we find combinations arise which affect in the greater or lesser degree the 651 unions of which England and Wales are composed, involving the levying and collection (according to the last returns) of no less a sum than 9,512,655*l.*, and a total expenditure of 9,325,072*l.*, 42,864*l.* having been expended for parochial assessment, the importance of the matter is evident. The passing the "Union Assessment Committee Act, 1862," in the further development of the great scheme of parochial jurisprudence, brought into being 651 distinct and separate assessment committees as representative of the several unions before referred to, each committee consisting of one-third *ex officio* and two-thirds elected guardians, to whom has been confided the appellate jurisdiction over and arbitration of "the net annual or rateable value" (in conventional term, "valuation") respectively of every acre or plot or patch of land, from the manor, mansion, and park of the nobleman, to the allotment piece of the commoner, as legally rateable, not specially exempted nor extra-parochial,—in short, the determination of the assessment of every hereditament held in beneficial occupation throughout the country—from the Bank of England, the Docks, the New River, water and gas works, railways in all their ramifications, and all other similar properties, manufacturing, distributing, or productive, throughout the country, downwards to the smallest tenantable hut or hovel. Jurisdiction so vast, united with powers so comprehensive, necessarily requires a certain degree of knowledge and experience, which could not reasonably be expected from bodies or committees thus accidentally brought together. Had an original valuation of the country been expected in the first instance, a thorough acquaintance with the laws and practice of parochial assessment and valuation, as expounded by the decisions of the Court of Queen's Bench, also of surveying and "estimating," would have naturally been pre-supposed and expected from such a tribunal as the Court of Appellate Jurisdiction now referred to (which in reality each assessment committee forms), had the Legislature confided the actual and bonâ fide valuation indiscriminately to a committee thus brought together. Appellate jurisdiction and arbitration, therefore, on items of controverted rating and disputed value, rather appear to predominate attributively in the constitution of this committee, since no appellant can obtain redress, either at Quarter Session or even in the Court of Queen's Bench, until after prior adjudication on each individual case by an assessment committee. The preliminary power of pre-nomination, or prior valuation, when held in combination with the faculty of ultimate determination, would most assuredly prove anomalous, and represent as *mal* an association as the identity, combination, and appearance of the superintending power and authority when made manifest in an executive capacity, the one being destructive of the other, and both open to suspicion. Thus much as regards the power, constitution, and qualifications of committees, appointed under the Parochial Assessment Act by virtue of the statute 1862; and since this period, excepting where interfered with by local Acts (which present an exemption), or now remaining incomplete. Every parish and union throughout the country, inclusive of the city of London, has been either revalued, or had the existing valuation corrected, readjusted, or confirmed, through the agency of its representative assessment committee, a work in theory second in statistical and numerical importance to the Ordnance survey, and to which, if rightly put together and concluded, each corresponding parochial "Valuation List" should form its own *terrier*, and in mass constructively, as a whole, the "Book of Reference."

It is, however, to be regretted in the first instance, that assessment committees, in some cases, appear to have resorted somewhat early to combination, at least in many parts,—either in county or district association,—to discuss and determine upon "a scale or per-centage" deduction which had been or should be made from annual value, in order correctly to arrive at or attain that great desideratum,—"net annual value." Under this head nothing possibly can be more clear and definite than the Act of Parliament 6 & 7 William IV., c. 96,—he who runs may read,—which enacts that this, and by inference all items therein included, should "be made upon an estimate of the several hereditaments." This direction is unqualified. Nevertheless, wherever the combination now referred to has existed to settle "deductions," it was sectional in its origin,—as motives were obvious; proceedings were consequently arbitrary, and conclusions incongruous and conflicting; therefore, in special application, "unfair, unjust, and unequal," and subversive of the letter as of the spirit of the Act (last referred to), the preamble of which recites,—"Whereas it is desirable to establish one uniform mode of rating throughout England and Wales." Uniformity of deduction proves no uniformity of valuation, unless all circumstances, states, and conditions are equal. The application indiscriminately, therefore, of no uniform or per-centage scale of deduction in grouped or collective application can satisfy the terms and conditions of the Parochial Assessment Act so long as the well-known terms "each and several" convey a synonymous signification; and this statute has reference to the "several hereditaments rated," the valuation of which, to be legal, must be separately "estimated,"—as separately rateable,—which principle must be definite, singular, and demonstrative in its application. It should here be stated of the

"Assessment Committee Act of 1862," that "nothing therein contained," &c., shall in any way interfere with the provisions of the original "Act to regulate Parochial Assessments," since it is clearly set forth that the former is merely referrible to the executive body as exponent, or, rather, as the amplification of the latter. The two Acts must be read concurrently to be illustrated by the original statute as the only true basis and standard of assessment, otherwise no "equal pound rate" can possibly be sustained, nor the "competent sum or sums of money" be raised in accordance with the statute 43rd Elizabeth, "according to the ability of the same."

That the proceedings of some assessment committees out of the 651 (who all stand alike in mutual responsibility to the Poor Law Board, each having annually to report its doings) are not exactly in concert with the rest, nor in exact conformity with the foregoing recapitulation and reading of the statutes, will be seen on reference to the requirements of the assessment committee of the Clun Union, Bishop's Castle, Shropshire; *ex. gr.*, on this committee endeavouring to obtain the services of a *competent* surveyor to perform the valuation of this union (16th March last), one proviso is distinctly reserved in relation to this *vexata questio*, "statuteable deductions," viz. "The valuer, when appointed, will receive instructions from the Assessment Committee as to *deductions* he will make from the gross estimated rental in order to arrive at the rateable value."

After the foregoing observations comment will be superfluous, unless this assessment committee mistake their own qualifications,—since the text of the Parochial Assessment Act has already been quoted correctly, and we have again made reference to the statute, from which we learn that the foregoing proviso is not only made in contravention of 6 & 7 Will. IV., c. 96, but under the further instructions to be given in relation to "statuteable deductions," the practice hereof will be in diametrical opposition to, as in declared violation of, the enactments therein set forth, whether made under combination or not. If recognised under the former, so much the worse, since peradventure this fundamental error may possibly prevail and pervade the assessment of the entire county. Verily, assessment committees might just as well make their own valuations at once as define their own "deductions," and so place themselves in antagonism with every ratepayer throughout the union, as some committees have done before, adopting as surveyor substitute the casual collector or amateur assistant overseer. By this expedient, the appellate jurisdiction of this court of legal arbitration might thus merge the exercise of its own proper functions in the confusion of advocacy, with the right of final adjudication reserved, or a truce upon appellate jurisdiction altogether. If the so-called discretion of any assessment committee whatever is to prevail in matters of preliminary valuation, then, in a moral as in a fiscal sense, before such a tribunal, each case will be prejudged, and the final issue consequently must become little else than a fiction or a sham, at once partial, uncertain, and inconclusive.

## NORTHERN ARCHITECTURAL ASSOCIATION.

THE ordinary quarterly meeting of the above Association was held in the OldCastle, Newcastle, on Tuesday, the 10th inst., when there was a numerous attendance. Mr. Dunn, vice-president, in the chair.

Messrs. Dunn, Oliver, and Pritchett were appointed delegates to attend the annual meeting of the Architectural Alliance.

The report of last year's proceedings of the Alliance was referred to the committee, to report upon at a special meeting to be called for that purpose.

Mr. G. G. Hoskings and Mr. Ullathorne were elected members.

The secretary then read a letter from Mr. Robson, hon. secretary of the Master Builders' Association, calling attention to the fact of the dispute now waging between the masons and the masters. The letter asked that the Association should remain neutral in the dispute; the masons were on strike for a diminution of the hours of labour, and it was reported that the demand had been acceded to by Mr. Parnell, a member of the Architectural Association, on account of the men engaged under him at the *Newcastle Daily Chronicle* offices, thus rendering ineffectual the means taken by the builders, prolonging the strike, and causing a serious loss to those who had heavy contracts on hand, through their being obliged to give way to the demands of the men. In answer to this, Mr. Parnell wrote, that there was no foundation for the complaint of his having acted against the interests of the masters. The matter in dispute referred to the building intended for the *Chronicle* offices, where some mason-work is necessary for the engine-beds. This being required, he instructed the foreman to make the best arrangement he could with the men, as time was of great importance. A conversation ensued on this matter, and it was agreed that the explanation of Mr. Parnell was perfectly satisfactory. Mr. Thompson thought it was unwise of architects to undertake work where a contractor was not responsible. Mr. Oliver stated, that from an interview he had had with Mr. Parnell, he had arrived at the conclusion that Mr. Parnell was not responsible for the complaints made against him. In this case, Mr. Parnell's employer required the work to be done at the new *Chronicle* office as quickly as possible, cost what it might, because all arrangements had been made for the completion of the work in a given time. Messrs. Walker, Kyle, Hogg, and Dunn also took part in the discussion, all more or less agreeing in the course adopted by Mr. Parnell, and ultimately it was agreed that the Association could do nothing in the matter between the master builders and the men. They also deemed Mr. Parnell's explanation satisfactory, and believed that he had no intention to injure the interests of the master builders. A letter was read from the secretary of the voluntary examination committee desiring an expression of opinion as to the results of the examinations. This was referred to the committee.

The new bye-laws of the Corporation of Newcastle next came under consideration, when a strong feeling was expressed as to some minor points, such as the depositing of elevations in addition to sections and plans and general specifications, which was thought unnecessary. Mr. Oliver was requested to attend to the interests of the Association as regarded these matters, that gentleman being a member of the Town Council.

Mr. Dunn exhibited an interior view of the proposed museum for the Antiquarian Society, and Mr. Oliver exhibited drawings of the parish church of St. Cuthbert, at Bedlington, which is now in course of restoration under his direction.

Mr. Lamb then read a paper on "Perpendicular Gothic Architecture," for which a vote of thanks was accorded by the meeting.

## FINANCE AND PANIC.

THE past winter, while it has been unprecedentedly mild, has not been, the gardeners tell us, favourable to vegetation. Never, they say, have they lost so many flowers. Frost, their natural foe at the season, they have means to resist; but against the more insidious evil of damp they have had no power to guard, and thus the lovely show of varied blooms with which our suburban nurseries have welcomed Easter have been diminished by an uncounted number of "damped" plants.

There are plants of another growth, not raised, indeed, under glass, for sunlight is not their element, but which may properly be said to have been forced, to which the winter has been even more unkind. Those rapid, unnatural, and unhealthy growths, ill-managed and speculative trading companies, have suffered far more damage than the tenderest green-leaved plants; and, as it is not so easy to ascertain the actual state of health of one of these artificial organizations as it is to observe how leaf and bud and blossom shrivel and fade, or swell and push and flourish, so is the panic that has followed one or two cases of destruction wide and disastrous.

That such misfortunes, to call them by a polite name, would occur, was plain to every man of consideration when the old law of partnership was altered. That law, like very much of our statute and even of our common law, was attended with serious disadvantages; but it was clear, intelligible, tolerably well understood, and the habits of the people had been formed in accordance with its very stringent provisions. It cannot be said that it was just. It was one of those laws which no legislature for an ideal state or improviser of a code would have proposed. It is possible that, the good and evil which it effected fairly weighed against one another, it was desirable that it should be altered; but it was certain that such an alteration would be attended with a crop of misadventures before the public mind became accustomed to the new order of things. And so it has proved and is proving.

It cannot be doubted that the principle of association is one of the earliest, and one of the most fertile that are developed by civilization. It is a great social principle; nor can it be considered to be peculiar to civilised men, or indeed to mankind at all, for we find its most regular and most faultless operation in the divinely instructed polities of the bee and of the ant. But it has its function and its limit, and can no more be trifled with with impunity than it can safely be left out of sight. It is by associating their wealth, their skill, their science, that men have made the great physical and intellectual, or rather scientific, progress that was prophesied or dreamed of by Bacon. But for association to be successful, it is obvious not only that it must be well directed and well conducted, but that the contributions as well as the contributors shall be of real and actual value. An association of needy men does not constitute a great capitalist.

That word "capitalist" is one that, if words had to give account of their actions, would have much to answer for. It is one of those few half-understood expressions, by the use of which a subject that should be dealt with by common sense is set apart as forming a pseudo-science. As to their own immediate personal money matters, most men, indeed, admit the guidance of ordinary prudence. But let a question arise ever so little beyond the limits of personal experience, and the wise maxims that unconsciously regulate the transactions of daily life are too often forgotten, and men eagerly listen either to the groundless hopes, or the equally groundless fears of their most casual acquaintance, and seek the advice of others no better fitted than themselves to advise as to questions that only require clear, plain, and honest statement to solve themselves.

Nothing can be more simple than the facts which form the basis of associations for purposes of business. When the object to be attained is of such magnitude as to exceed the means of individuals to carry out, it can only be attained by the combination of the resources of several, or of many individuals. Railways, for example, requiring the outlay of millions of money, in obtaining Acts of Parliament, purchase of land, and construction of works, before any returns can be earned, can only be made by the Government of the country, which commands large resources, or by the association of shareholders, as in this country. But while it is necessary, in order to collect the large sums of money which must be expended before any earnings come in, to resort to combination of resources, it is well known that the application of these resources will be less carefully and less skilfully directed than in the case of individual enterprise. If two railways, of equal length and under similar circumstances, were constructed, one by a large company and the other by a single individual, no one can doubt that the latter would be much more economically completed than the former. According to experience and according to human nature, a man looks after the expenditure of his own money in his own enterprise far more keenly than he would do if he were merely the officer of an association dealing with the funds of the association. While, therefore, for purposes of such magnitude as to render association necessary, the company, if honestly and ably administered, may amply succeed; if the limits of the enterprise be so far reduced as to allow individual enterprise to compete with associated enterprise, the former will, in all probability, carry the day. The great company may have actually wasted a quarter of its funds; but its work is done, and whether it be the shareholders or the public that suffer (which will depend on the possibility of competition on the part of other great companies), the enterprise goes on. But in a small company such a waste of resources would at once put the association at a corresponding disadvantage as regarded individual competition, and the destruction of the company, or, at least, great loss to the shareholders, would be the certain result.

It is for these plain and simple reasons, stated, perhaps, with some circumlocution in order to avoid any of the words invented or claimed by the lecturers on political economy, that the change of the law as to liabilities of partners, and the rapid rise of a large crop of limited companies, was certain to produce a considerable amount of disaster. It is true that other causes have combined to render the pressure now felt more severe. The great influx of Californian and Australian gold, which has rendered that metal more plentiful, and has, therefore, raised the price of all other articles, as measured in gold, has caused a disturbance which it is difficult accurately to measure; although if we regard it as indicated, either by the price of diamonds and precious stones, the price of meat and cattle, or the prices paid for journeymen's labour, we shall have reason to conclude that a fall in the value of gold to the extent of twenty per cent. has taken or is taking place by a gradual process that is not very severely felt, except by persons of fixed incomes. The great disturbance to our manufactures caused by the American war, the large exports of goods to America since its close, and the extremely unsettled state of all financial transactions in or with the Transatlantic republic, is a second element of troubles in the commercial world. And the imminence of a great European war, a war of which, condemned though it be alike by wisdom and by justice, every day brings some fresh menace, depresses the price of all public securities, and increases the general feeling of vague incertitude to which home politics add their share.

In a social atmosphere thus menaced with storm from so many points of the horizon, the exposure of the manner in which some companies have been concocted, and in which others have been carried on, has probably been the exciting cause of a panic which, if unreasoning, as panic always is, has not been altogether unfounded. To the man who, having money to invest, brings to bear on the question of how best to lay by his earnings in a safe and reproductive form, the same patient thought and practical sagacity that have enabled him to accumulate them, we can only say, wait the turn of the tide, the panic can not hurt you. A *bonâ fide* investment is not affected by fluctuations in the market price, unless you are forced to sell,—that is to say, in nine cases out of ten, unless you have endeavoured to invest money that you had not earned. But with the speculator the case is different. The man who incurs liability by the purchase of shares in an undertaking which he himself is incompetent to conduct, and of the conducting of which he is unable to form a sound opinion; who has perhaps been tempted to buy by the very premium at which he purchased the shares, or by the promise of dividends to be earned by his company such as no individual competitor in the business ever drew from his best personal exertions,—this man we can only recommend to take comfort in the fact that his subscription is now limited in amount, and that in losing his money to that extent, he has purchased a very valuable lesson as to the disposal of his future earnings.

## IMPROVEMENT OF WORKHOUSE INFIRMARIES.

A VERY numerous and influential deputation of the Association for the Improvement of London Workhouse Infirmaries, headed by the Earl of Carnarvon, the Archbishop of York, and others, had an interview with the Hon. C. P. Villiers, M.P., the president of the Board of Trade, on Saturday last, and laid before him the resolutions passed at the public meeting held lately at Willis's Rooms, and the views of the committee on the subject. The latter, endorsed by a number of eminent medical men, may be thus expressed:—

The sick poor should be separated from the able-bodied paupers, and their treatment should be placed under a distinct management. In lieu of sick-wards annexed to each workhouse, consolidated infirmaries should be provided, where the following rules of hospital management should be adopted under skilled supervision. They are those generally accepted in this and other European countries. 1. The buildings should be specially devised for the purpose, of suitable construction, and on healthy sites. The rules laid down by the Barrack and Hospital Commission may be consulted with advantage on this subject. 2. Not less than 1,000 (and for particular classes of cases 1,200 to 1,500) cubic feet of air should be allowed to each patient. 3. The nursing should be conducted entirely by a paid staff, and there should be not less than one day-nurse, one night-nurse, and one assistant nurse for each fifty patients. 4. There should be resident medical officers in the proportion of not less than one for 250 patients. 5. The medical officers should not have any pecuniary interest whatever in the medicine supplied, nor should they be charged with the duty of dispensing them. 6. A judicious classification of patients should be strictly observed, the epileptic and imbecile, the acutely sick, and the aged and infirm being treated in separate wards. 7. The aged and infirm, the chronically sick, and the convalescent should be provided with day-rooms, separate from the dormitories.

Mr. Villiers, in reply, showed that he is wholly with the Society in their views, and gave reason to hope that something will be attempted in the required direction. The least that can be done is to place the sick of our parishes on the footing of ordinary hospital patients.

## PROPOSED DWELLINGS FOR WORKING CLASSES, AT LAUSANNE.

A SCHEME is on foot at Lausanne, for the erection of improved dwellings for the working classes, which shall combine the two essential requisites of comfort and economy in construction. A sum of 16,000*l.* will be required, and it is contemplated that, with proper management a return of 6 per cent. may be obtained. The design embraces a large refectory, which may also be used for lectures, concerts, &c., schools for the children, wash-houses fitted with every convenience for drying and ironing; baths, bakehouse, and other offices. In addition to these conveniences, workshops are to be erected for the use of the co-operative societies. The inner court, which is to be provided with balconies at each story, is to be covered with a glass roof, so as to afford a dry open space, serving both as a playground for the children, and a place of recreation for their elders. The building will contain 300 rooms, excluding the offices in the basement and ground-floor. The promoters estimate the returns from the latter at 200*l.* annually, and propose to make a charge of 3*l.* 7*s.* 6*d.* per year for each of the rooms. The total returns would, supposing all the rooms to be occupied, amount to upwards of 1,200*l.* per annum.

The Familistery, at Guise, made known to the English public in our pages, is the model aimed at. The illustrations we published of that establishment are understood to have influenced the movement in Lausanne.

## IMPROVEMENT OF DWELLINGS.

*Central Cottage Improvement Society.* — The annual general meeting of the members and friends of this society has been held at Willis's Rooms, St. James's,—the Rev. T. Pyne in the chair. The report for 1865-6 stated that during the past two years the society has been working steadily on, and the secretary has replied to numerous letters of inquiry on subjects connected with cottage building in all parts of the kingdom, and some from abroad. About 50 sets of plans have been sold to persons not subscribers, and a considerable number of cottages have been erected in various parts of this country and in Ireland. The council congratulated the members upon the successful formation of several provincial associations for cottage improvement, which had realised good dividends. The balance showed that the funds of the society were not sufficient for its purposes. The report was adopted, and various resolutions were passed in furtherance of the society's views. A general opinion was expressed that in consequence of the encroachments of metropolitan railways the subject was rapidly rising in importance, and while the building of homes for the working classes in London was a most valuable boon, an equal necessity now existed for giving them the advantage of suburban dwellings, which the cheap trains would enable them easily to reach.

*The Cellar Dwellings of Liverpool.*—At a recent meeting of the Liverpool Health Committee, a report being presented by the inspector of nuisances as to certain cellars unlawfully occupied as sleeping apartments, it was stated in a conversation that ensued that 9,000 cellars still improperly occupied. Mr. Whitty moved that the Parliamentary committee be instructed to obtain in their next bill powers to fill up those cellars which are repeatedly used in violation of the law. The borough surveyor said it would cost 380,000*l.* to fill up all the cellars.

*Overcrowding in Liverpool, and its Remedy.*—The town council have confirmed the recommendation of the improvement committee, to apply to Parliament for powers, in the next Improvement Bill, to open out a new street, twenty yards wide, through a densely-crowded district in Vauxhall Ward, extending from Lime-kiln-lane to Great Howard-street. Thence the new street will be continued by the London and North-Western Railway Company, the same width, to the line of docks, forming a direct communication with Trafalgar and Victoria Docks. In its course it will widen narrow and unhealthy streets, and cut through twenty of the closed courts, which form such an objectionable feature of this and other districts of the town, where overcrowding has assumed some of its worst and most demoralising forms, while it will open out sites for the erection of improved blocks of labourers' dwellings. The labourers' dwelling sub-committee of the health committee also have resolved to recommend the council to set aside suitable sites on the corporation estates, for the erection of labourers' dwellings, on plans approved of by the council, such sites to be sold on chief rents for that purpose only. A number of sites have been inspected.

## COMPETITIONS.

*Bolton Mechanics' Institution.*—The committee have awarded the premium of 20*l.* for the best design for the new Mechanics' Institution, to No. 5, "As you like it," by Messrs. Cunliffe & Freeman, architects, of Bolton, who were the only local competitors; the second, 10*l.*, being awarded to No. 30, "Truth prevails," by Mr. W. B. Stewart, of Scarborough. Of the remaining four selected designs, "Spes" was by Mr. Wm. Hill, of Leeds; "Education," Mr. Julian Young, of Derby; "Non dubitanter," Messrs. Jeffery & Skiller, of Hastings; and a circular device, Mr. R. W. Hughes, of Preston. The whole of the plans remained on view in the Reading-room till Thursday, and 73 individuals had affixed their signature to a book—40 in favour of "As you like it;" 24 for "Spes;" and 9 for "Truth prevails."

## PROPOSED LAW COURTS COMPETITION.

THE commissioners met on Wednesday last, and decided on increasing the number of competitors to twelve. The judges met on Thursday afternoon, but owing to the debate in the House they were obliged to adjourn before coming to a final decision.

## NEW BUILDING IN MANCHESTER.

THE new buildings for the Lancashire Insurance Office, at the corner of St. Ann's-square, which have been recently erected by the directors of the Lancashire Insurance Company, form an architectural improvement in the centre of the town which may be considered worthy of notice. The site occupied by the new building is about 120 ft. between Exchange-street and Barton's-buildings, and about 57 ft. wide between Red Lion-street and the repository of Messrs. Agnew & Son. The general style of the design of the two fronts may be described as Ionic, freely treated, with a decoration of incised work in the stone, which gives a peculiar character to the façades. The arrangement of the roof and the external accommodation thereon, appear to have led the architect into a style of design in the upper part, which may, by sticklers for precedent, be deemed rather incongruous with the Ionic order. There are two principal entrance doorways, one in Exchange-street, and the other in Red Lion-street, and these are made ornamental by carvings in the stone-work of the arms of the Lancashire Insurance Company. The windows in the second story have ornamental stone balustrades, and so have the central windows in the story above. In the roof there are dormer windows, between which are circular glazed openings. The principal offices of the Lancashire Insurance Company are on the

ground floor, approached by well-lighted passages, and the company's board-room and other conveniences are on the first-floor. The remainder of the building is arranged as large rooms, office, stores, and two convenient shops. These latter are made entirely fireproof, and defended against the designs of burglars by being entirely surrounded by thick iron boiler plates, riveted together, and forming a complete inner lining. All the openings in the shops and on the street-floor level are provided with Bunnett's ironproof shutters. In a central part of the building is an open court for the purpose of affording light and ventilation to the staircase, corridors, lavatories, and various offices. The walls of this court are covered with glazed white tiles, which reflect the light, and which are washed bright by every shower of rain. The following is a more minute description of the premises occupied by the insurance company:—The principal office or telling-room is 57 ft. long, 35 ft. 6 in. wide, and 50 ft. high to the eye of the dome. The room is square in the central portion below, and formed into a circular dome above, from which ample light is diffused through plate-glass of a light azure tint. In the direction of the length of the room, there is at each end an arched recess, having a balustraded gallery, fitted with presses and closets for stationery. Under one of these galleries is a large fire-proof safe, of two floors in height. At the sides of the rooms are also arched recesses, but of comparatively small depth. In each of the two deep recesses is a *bas-relief*, by Mr. Lynn, of London, representing fire insurance in one, and life insurance in the other. The arms of London, Manchester, Liverpool, and Glasgow are represented upon four spandrels supporting the dome; and above these, forming a circle round the dome, are sixteen panels filled in with ornamental designs. The fittings and furniture throughout are of oak. Adjoining the principal room is a vestibule leading to the manager's room, waiting-rooms, &c., which are spacious and convenient. The board-room is on the first floor, having its principal approach from the main staircase and corridor, but also communicating with the principal office by means of a circular stair. Telegraphs and speaking-tubes are used as a means of communication between the principal office, the board-room, and the manager's room. The exterior is built with Huddersfield stone, elaborately worked, and there is some good carving in the ornamental portions. The architect is Mr. Thomas Turner, of Glasgow and Belfast; and the entire contract for the building has been executed by Messrs. Neill & Sons, of Strangeways, Manchester.

## THE EDINBURGH SANITARY STREET IMPROVEMENTS.

THE City Council have adopted the following among other resolutions approved by the Lord Provost's Committee:—

1. That the time has now come when important sanitary and other improvements should be effected in the city.
2. That, in order to defray the cost of these improvements, an assessment (leviable in equal proportions from landlords and tenants), at a rate not exceeding twopence per pound per annum on the gross rental, should be levied for a period not exceeding twenty years.
3. That, in order to fix the precise nature and extent of the improvements, it be remitted to the Lord Provost's Committee to take such professional assistance as they may consider necessary to prepare the requisite surveys, plans, and estimates.

In the course of his remarks, the Lord Provost, who moved the resolutions, stated that long before a single tenement is pulled down there will be hundreds of new dwellings for workmen erected on grounds belonging to Heriot's hospital. He was quite willing to modify or cast aside his own notions, and leave the matter to the professional advisers who may be employed, including the City Officer of Public Health. In the face of several amendments the resolutions were agreed to by a majority of 21 to 16.

## COMPENSATIONS.

*F. George* v. *The Metropolitan and St. John's Wood Railway.*—This case was heard at the Sheriffs' Court, Red Lion-square, before Mr. Humphreys, coroner, and a special jury. The claim was 7,000*l.*, for leasehold residential property, "All Saints' Lodge," near All Saints' Church, Finchley-road, St. John's Wood. Mr. Hawkins, Q.C., and Mr. Murphy appeared for the claimant; Mr. Lloyd represented the company. Mr. George was called and several witnesses. He took the property in 1849, and paid 2,746*l.* He laid out 900*l.* before he went in, and had expended sums in stabling, conservatories, and a large aquarium, and had handsomely fitted up the residence. He had no wish to leave, but, as the company had given him notice that they wanted a "slip" of his ground, he had required them to take the whole, under the 92nd clause of the Lands Clauses Act. It was stated in this case that if Mr. George had taken compensation for a slip he could not afterwards have made a further claim, whatever damage had been done to the property. The present rental was stated to be 300*l.* a year, so much had property increased in the neighbourhood. Several surveyors were examined in support of the claim, and, after the case had occupied some time, a verdict was agreed upon for 5,500*l.*, with an understanding as to the present occupancy by Mr. George.

## THE ARCHITECTURAL ASSOCIATION.

THE ordinary meeting of members was held at the House, in Conduit-street, on Friday evening, the 6th instant.

The chair was taken by Mr. E. J. Tarver.

The following gentlemen were elected members of the Association:—Mr. Alfred Waterhouse, 8, New Cavendish-street; Mr. R. Marnock, St. John-street, Regent's Park; Mr. F. Dyer, 18, Bucklersbury; Mr. G. A. Allen, 3, Westminster-chambers; and Mr. G. C. Menie, Overton-road, Angel-town.

Mr. J. D. Mathews (hon. sec.) read a letter from Mr. J. W. Papworth, one of the examiners nominated by the Institute, to the effect that his brother examiners wished him to act as secretary and to request that the honorary secretaries of the Association would consider the course of experiments, and would either communicate its entire approval of the results or any suggestions which the Association upon consideration might deem to be desirable.

Mr. Riddett said, that the voluntary examination class had not yet met, in consequence of the uncertainty which appeared to exist in reference to the examinations by the Institute. As, however, there had been a recent examination, a meeting of the Association would be called with the view of starting the class again.

Mr. L. W. Ridge, referring to the portion of Mr. Papworth's communication requesting suggestions from the Association, observed that, what in his opinion was wanted to give effect to the voluntary examinations was, that the Institute should give a certificate that Mr. So-and-so had duly presented himself, and had passed a satisfactory examination. If this were signed by the examiners, he thought it would be satisfactory. He hoped, however, that the Association would respond to the invitation on the part of the examiners and moderators, and make suggestions out of which some useful results might arise.

A member inquired whether it was not true that the Institute had intimated that it was not prepared, or possibly had not the power, to grant diplomas to architects.

Mr. Ridge said he for one certainly did not consider the Institute had intimated anything of the sort. On the contrary, he was disposed to gather from the letter of Mr. Papworth that they would consider in a favourable spirit any suggestions tending towards the accomplishment of that object which the Association might have to offer.

Mr. Mathews said it would be for the Association to consider whether they might not make a suggestion to the Institute to give a diploma, a certificate, or a medal.

Mr. Riddett suggested whether it would not be desirable to postpone replying to the letter until after the next meeting of the Association.

Mr. Mathews thought this would not be possible, as the Institute expected an answer by the 7th of May.

Mr. T. Roger Smith said the Institute was now considering a number of suggestions, and that under such circumstances it would be very undesirable to delay any which the Association might have to offer. A suggestion had been made that there should be first and second class certificates of merit: that some certificate was desirable he had no doubt, and he recommended the Association to agitate the question until it was granted, which it was sure to be sooner or later.

Mr. Ridge then proposed a resolution, to the effect that the Association considered it to be highly desirable that a certificate setting forth that he had passed in a particular class should be given to a candidate passing the examination, and that it should be signed by the examiners, and bear the seal of the Institute.

Mr. T. R. Smith said he was willing to second the resolution, on the understanding that it be forwarded to Mr. Papworth.

The resolution was then put and carried unanimously.

Mr. Florence then brought forward a scheme for the formation of a class for water-colour drawing. Having observed upon the importance of an architect being able to colour his own sketches to his satisfaction, he observed that it was proposed that the class should meet on alternate Fridays for two hours, and that it should consist of twelve members, who should subscribe three guineas each for a course of twelve lessons. It was also proposed to have some lessons in out-door sketching, for which, however, a separate charge would be made. Mr. Florence added that he had been in communication with several artists of distinction, and that one of great eminence had consented to direct the studies of the class.

The Chairman inquired in what manner the selection of candidates was to be made in case more than twelve gentlemen wished to join the class?

Mr. Florence presumed that no one would join the class who had not already some knowledge of sketching.

In reply to an inquiry, Mr. Florence stated that Mr. Aaron Penley was the artist who was willing to undertake the direction of the class.

The Chairman said he hoped that several candidates would come forward to join the class, as it was impossible to overrate the importance to an architect of being able to colour his own drawings.

It was then arranged that the subject should be further taken into consideration on the following Friday.

The Chairman said, that as Mr. F. P. Cockerell, who had promised a paper on the works and sketches of the late Professor Cockerell, was unable to be present, it was proposed to resume the adjourned debate on Mr. T. R. Smith's paper, "Study as a Preparation for Practice," read on the evening of the 8th of December last.

Some discussion followed, in which Mr. Ridge, Mr. Mathews, Mr. T. R. Smith, and others took part.

## OPENING OF SWINDON CORN EXCHANGE.

THE new Corn Exchange at Swindon has been formally opened. The new building adjoins the town-hall, a convenient site, held Mr. Goddard, M.P., on a lease for ninety-nine years. The style is Grecian, and the material native stone, with Bath stone dressings. There is a tower 83 ft. high, with space for clock on three sides. The approach to the Corn Exchange is from the square, with entrance under the tower through a vestibule. The room is 110 ft. long by 50 ft. wide, and 26 ft. high to the under-side of the roof, which is partly open. The under-side of the tie-beams, 12 ft. from the walls on each side, is ceiled and divided into panels, the centre timbers being open and covered with glass; this, with windows all round the room, gives ample light. It is also provided with sixty star gas-lights. The woodwork is varnished only. Adjoining the Exchange is the butter and poultry market, which is also covered with glass; a large dome occupies the centre, under which is to be a fountain. Under the Corn Exchange are cellars for storeage. The building is arranged for public meetings. Messrs. Wilson & Wilcox, of Bath, were the architects, under whom Mr. Phillips has carried out the works. Mr. H. Winfield officiated as clerk of the works.

## MINOR WORKS UNDER GOVERNMENT.

SIR,—Can you inform your readers who it is that is responsible for the total want of attention and taste often exhibited in the minor works of our public buildings belonging to Government, by which they are disfigured and made the laughing-stock of foreigners.

There has very lately been a new entrance made, as an addition, at the north end of the Banqueting House used as the Chapel Royal, Whitehall; and it has been built by such clumsy

workmen that, though it is only some 10 ft. long, they could not manage to build either straight or level, as any schoolboy could see by looking at the cornice; while a thing called a door frontispiece has been formed with a *Grecian* bedmould to a building which is one of our most valued and admired Italian structures.

Some few years ago, the offices of the Post-office were enlarged and brought forward as far as the columns on each side of the atrium, and in refixing the capitals of the pilasters, there was not one that was correctly placed, some up, some down, some in, and some out.

Surely Government could afford to pay for proper workmen and a proper overseer.

A READER.

## ARTICLED PUPILS.

SIR,—I beg you will be kind enough to afford me a small space in your "correspondence" column to state a few facts for your consideration, and to invite the opinion of your numerous readers on them for my guidance.

I am articled to an eminent architect for six years; more than three of which have expired, without, I may say, my having been taught a single particle of my profession. Anything I have learnt has been by dint of constant labour at home in the evening; which, after working all day, is rather hard; or picked up from visitors, such as contractors, &c., coming to the office.

I saw by some letters in your paper a short time ago, that the master is only required to teach the practical part of his business, but I am taught none. Now, sir, as I shall be of age very soon, before my apprenticeship has been completed, can you kindly advise me what to do, as it is a question of great importance to me?

ANXIETY.

## ST. JOHN'S CROSS, EDINBURGH.

IN the very interesting article on "The Market Crosses of Scotland," in the *Builder*, of March 17th, the writer desiderates information as to what has become of St. John's Cross, which formerly stood in the Canongate, Edinburgh, opposite to St. John-street. If he will look at p. 497 of last year's *Builder*, he will find that this interesting cross is still in existence, together with some account of its distinctive features and history. On another occasion I will be glad to inform him and your readers what has become of the Girth Cross. I cannot at the moment lay my hand on my notes, and care not to trust to memory.

F. M.

## LIGHT IN THE STREETS.

EXTRA light has been put upon the highway to knowledge: in other words, the road through Brompton to the South Kensington Museum is being lighted by more than double the former number of lamp-posts. I do not write merely to praise the good step, but to suggest that the top four panes, or what may be called the roof of the lamp, should be lined with bright tin, or, if not too expensive, silvered glass, which would then throw the light where it is wanted, and so be of service.

S. G.

*** We have before now described a street-lamp used in Paris, intended to effect what our correspondent wisely desires.

## SULPHATE OF IRON AS A DISINFECTANT.

SIR,—Great attention is paid, and with reason, in this country, in Holland, and in Belgium, to the disinfection of stalls and of the excrements of animals of the bovine race infected with typhus, in order to arrest the ravages of this terribly contagious malady.

The use of phosphoric acid, which is proposed for this purpose, is rational in that it enriches the manure, but not if you consider the expense, the difficulty of transport, and the many precautions necessary in handling it.

Sulphate of iron, on the contrary, is of insignificant value (say a farthing per pound), economical, and easy of employment; and having great effect upon all animal matters, would completely purify the infected places and the manures of animals suffering from typhus. It does not injure the manure, but conserves its most energetic parts by converting the carbonate of ammonia into sulphate of ammonia, a fixed salt, which is easily appropriated by the plants.

It was in 1845 that Mr. Schattermann, director of the mines of Bouxwiller, departement du Bas-Rhin, proposed the disinfection of fecal matters and of manures by means of sulphate of iron, and since then this salt has been generally employed in France for this purpose, as well as to purify the slaughter-houses, ditches, and all places where noxious emanations arise. Its use is very simple. Dissolved it gives a very acid liquid that can be handled without danger, and which penetrates everywhere when used to wash the infected places, or to mix with the manures.

When the cholera was at Marseilles, great quantities of sulphate of iron were used, not only in France, but also in Switzerland and in Germany, to disinfect closets, slaughter-houses, and all places giving off noxious emanations, and with perfectly satisfactory results.

I would add that if cattle that have died from rinderpest were saturated with a solution of sulphate of iron, they might be removed with perfect safety, even in the daytime, and the cost of disinfection would be some few pence only.

W. G. S. MOCKFORD.

## THE PREVALENCE OF THE YEW.

IN your interesting article a short time since, on the "yew tree," you raised an inquiry as to its frequency in the old churchyards. It is easily accounted for. The yew was formerly cultivated near the church for the sake of its branches, as a substitute for palms on Palm Sunday. After a special blessing for the occasion, the boughs were carried in procession (in remembrance of our Lord's triumphal entry into Jerusalem, commemorated on that day), and held during the recital of the Passion according to St. Matthew. The old rubric for the day, which is very curious, directs the priest to bless branches of palm, olive, or *other trees* (*sive aliarum arborum*), and to distribute them to the people, after which, the procession takes place. Palm branches were often imported for the purpose; but in England, box, willow, and chiefly yew, were used as substitutes. Hence the frequency of the tree in the old churchyards.

EDMUND BOSHELL.

## GRANITE TURNING.

IT will perhaps be interesting to you to know that *Guernsey granite* can be turned on a lathe. About two years since, I saw a block of Guernsey granite which had been turned for one of the balusters for the Thames Embankment. I saw this at the office of the Metropolitan Board of Works, in Mr. Lovick's room. The turning was most perfect, and had been executed by a Frenchman with a peculiar tool, the composition of which was a secret.

I may add, that Guernsey granite, or syenite, is the hardest known stone of its class, and will bear more crushing than any other, as proved by the experiments of the Trinity Corporation, who instituted a series of experiments to test the relative resisting power of granites. In their experiments, Guernsey granite was found capable of sustaining a greater crushing weight than any other granite tried, including Aberdeen granite.

Picks, of iron and steel, weighing 18 lb., are usual in rough-dressing this stone.

A. GIFFARD.

## CHURCH-BUILDING NEWS.

*Cambridge.*—The works of St. John's College new chapel go on steadily, says the local *Chronicle*. The main timbers are on from the apse, within a couple of bays from the tower, and give an idea of the outline that may be expected. Workmen are engaged on the organ-chamber roof, on the north side of the chapel, which is a detached roof, the same pitch as the chapel. The carvers are cutting away at the apse windows and windows adjoining; some of these are completed. The arcade caps and other carving works already finished show that this department will be thoroughly carried out. Masons are turning the tower arches of the ante-chapel, and setting the window-tracing and arches of the ante-chapel aisles. The mullions and jambs of the great west window are up to the tracery springing. The aisles of this ante-chapel will have ceiling of grained stonework, and so will the roof of the organ-chamber. The tower stands in the centre of the ante-chapel, and will be open for two stories, giving an elevation of about 100 ft. to the groined floor of the belfry. The main entrance is from the first court of the college, into the south aisle of the ante-chapel. The sides of this doorway are of great depth, and, with the arched head, will be full of sculpture and carving. It is the intention to fill the windows with stained glass, some of which are already ordered of Messrs. Clayton & Bell. The groined ceiling of the chapel will be finished in panels of inlaid woodwork.

*Wolverhampton.*—The foundation-stone of a new edifice, to be called Christ Church, Waterloo-road North, has been laid. The site of the new church, which will be in connexion with St. Peter's parish, is a plot of land at the extreme end of Waterloo-road North, and near the junction of the Stafford-road. New streets are here being formed, rows of new houses are rapidly springing up all around, and a large tract of land is offered to be disposed of for building purposes. The design for the church is in the Early Decorated style, to include a nave and aisles, with tower and spire at the south-east corner, and an apsidal chancel. The materials to be used in the construction of the edifice will be Codsall stone, with Bath stone dressings. The roof will be open-timbered, the latter stained and varnished, and, when completed, the church is intended to accommodate between 800 and 900 persons. The part to be now erected will be the principal portion of the nave, containing five bays. This will cost 1,800*l.*, including the site, of which nearly 900*l.* are still required. The architect is Mr. E. Banks, and Messrs. G. & F. Higham are the contractors.

*Taynton* (*Gloucestershire*).—Taynton Church, says the *Gloucestershire Chronicle*, is known as being perhaps the ugliest sacred building in the county. Erected, as was remarked by the preacher at the re-opening service, in a time when men despised and hated the splendours of church architecture, it was built in defiance of all ecclesiastical rule, north and south, and without a chancel. The founder was the Puritan alderman and friend of Cromwell, Thomas Pury. The date was 1660. The thick, plain cut walls and meaningless shape remained long, and remain now, as an evidence of Thomas Pury's sour Puritanical bigotry. The needful restoration of this church has been now nearly accomplished. The old plaster ceiling has been removed, and the space between the oaken rafters covered with blue plaster. There are three windows on the east and west sides inclosed in wooden frames, which were not weather-proof. These have given place to stone frames and mullions, with tracery in the heads. A badly-shaped window over the porch has been blocked up, and replaced by another, slightly arched. A gallery still disfigures the north end, where it must remain, for the sake of the room it affords, until a chancel can be added. The floor and walls are covered with monuments, several of them to the Holder family. The walls have been replastered. Outside, loose, heavy stones covering the roof have been replaced by Broseley tiles, and new coping stones have been put on the gable. The parapet wall of the porch has been removed, and a steep roof, corresponding with that of the church placed upon it. In front the mortar has been cleaned out of the joints of the stones, which have been pointed with dark mortar. This is being done all round the building. The little wood turret containing the bell has been faced with oak weather-boarding. The vestry at the south-end, behind the pulpit, has been re-opened, re-roofed, and re-floored. This vestry is used as a day-school. The church and school are warmed by Messrs. Haden's hot-air warming apparatus. The restoration has been effected by Messrs. Teague, of Tibberton, builders. The whole cost is nearly 500*l.* The only work not yet completed is the pointing of the outside, and the rebuilding of the churchyard wall. Mr. Fulljames has given his aid as architect of the restorations.

*Neath.*—Briton Ferry New Church has just been covered in, and forms one of the principal features in this rapidly increasing town. Mr.

R. Pritchard, of Llandaff, is the architect, and the builder is Mr. R. Roderick, of Margam. In consequence of the advanced state of the edifice the whole of the workmen employed have been regaled with a first-class supper, supplied by the incumbent of the place, the Rev. David Lewis.

*Sparkbrook.*—The foundation stone of Christ Church, Sparkbrook, has been laid. Mr. Sampson S. Lloyd gave the greatest portion of the site on which the new church will be erected. The other portion of the land was presented by the trustees of the Blue Coat School, and the funds were also aided by a large donation from the Church Extension Society. The church will be 104 ft. in length, 58 ft. in width, with a chancel of 25 ft., and will contain accommodation for 890 persons, all the seats being on the floor. Should this be insufficient, additional room can be made for some seventy more. The church spire will be 300 ft. in height, the material employed being Hampstead stone, with white Bath facings. The architects are Messrs. Medland, Maberley, & Medland, of London and Gloucester, the contractors being Messrs. Samuel Briggs & Son. The edifice is estimated to cost 6,771*l.*, of which 5,200*l.* have been subscribed or promised.

*West Dean.*—The new church recently erected in this parish has been consecrated by the Bishop of Salisbury. It is dedicated to St.-Mary-the-Virgin; is from the design of Messrs. Pownall & Young, of London; and is in the Early English style, comprising an apsidal chancel with side chapel on the north, a nave, and south porch. There is a slightly Swiss character about the edifice. The chancel is raised above the level of the nave, from which it is separated by a dwarf stone screen in the southern angle of which is the pulpit. There are four single lancets in the apse, filled with Early English pattern glass, by Messrs. Lavers & Barraud. The roof is blue, with gold stars, the outer portion dispersed in running patterns upon a stained and varnished ground. The floors are laid with Minton's tiles, and the edifice is fitted with a warming apparatus by Messrs. Haden. The sittings are of stained pine. Messrs. John Crook & Son, of West Dean, were the contractors.

*Gloucester.*—St. Nicholas's church has been reopened after partial restoration at a cost of about 1,900*l.* The flooring has been raised a foot, and rests on a foundation of concrete. The south arcade has been taken down, and the columns raised. The old gallery at the west end has been removed, and part of the carved panelling has been placed over the children's benches at that end. The organ now stands at the east end of the narrow north aisle, with an oaken screen in front of it. The coating of whitewash has been removed from the columns of the two arcades—decayed stones have been taken away—and the capitals of the two upper ones on either side have been recarved; as have also the corbels on which rest the transverse beams supporting the roof. The capitals of the columns have been carved with foliage, the corbels with figures of angels, &c. The beams themselves have been replaced and carved; and the ceiling and all the walls have been scraped and plastered. The chancel has been renovated. The large east window has been replaced, and it is now filled with stained glass, bearing emblems of the Trinity, the Cross, and the usual figures in the centre of each light. There is a new dormer window on the north side, and a new south window. The three-decker pulpit has been replaced by a carved oaken pulpit on the north side of the chancel arch. The pews have given place to modern open sittings, at the end of each of which is a piece of the panelling of the old pews. The carving that was in the church has been used. The columns and walls were cut into and weakened to make places for monuments. Wherever it has been necessary, these have been removed. Outside, the tower has been restored. The porch of the south aisle leading into Westgate-street has been renewed. A new porch has been built at the old entrance to the nave, and thus there is exposed a Norman Agnus Dei, discovered during the restoration. The chancel and aisles have been covered with coloured Broseley tiles; and the bulging wall of the north aisle has been renewed, and strengthened with additional buttresses. Mr. Jacques, jun., of Gloucester has been the architect of the restoration, and the work has been carried out by Messrs. Shepherd & Meredith.

*Bradenstoke.*—The new church at Bradenstoke has been consecrated. The edifice, which is capable of holding about 230 persons, is placed in the centre of the village of Clack, and has been erected after a design by Mr. Hansom, of Clifton. The building is of Gothic character. The pillars separating the aisle from the nave are of red Devonshire marble: all the supports and stonework, both in the interior and exterior of the church, are carved; the chancel is paved with glazed tiles in pattern. Mr. Pinniger, of Tytherton, near Chippenham, was the builder employed.

*Aust.*—The parish church has been re-opened for divine worship after undergoing a restoration. The church possesses an interest on account of its having been presented to John Wycliffe, in the year 1375, by King Edward III., and it was here he spent many years of his ministry. The church, however, fell into a state of great dilapidation, and an appeal to the parishioners for funds wherewith to restore it met with a hearty response. Mr. Leppincott, the lord of the manor, Mrs. Leppincott, and some of the local gentry contributed largely to the work. The restoration was commenced about twelve months ago. The old deal boxes which served for pews have all been taken away, and seats of more modern design substituted. Like many other ancient parish churches the carved oaken ceiling had been covered with plaster, but all this has been removed, and the roof restored to its original condition. On many of the panels are the initials "J. W." The cost of restoring the chancel has been defrayed by Mr. Leppincott, and three stained-glass windows have been put in the chancel at the expense of Mrs. Leppincott. Two carved stone stalls have been placed in the chancel for the accommodation of the choir, and a reredos of carved stone, executed by Mr. Margetson, of Bristol, has been fixed over the altar. The centre aisle has been paved with encaustic tiles, by Mr. Godwin, of Hereford. The communion-rails are by Mr. Skidmore, of Coventry. A carved stone pulpit has taken the place of the old one, and a new reading-desk has been erected. A vestry has been erected on the north side of the church. Messrs. Pope & Bindon, of Bristol, were the architects employed, and Mr. H. Hughes, of Bristol, the builder. The total cost is about 1,200*l.*, and the church will now accommodate 180 persons.

## DISSENTING CHURCH-BUILDING NEWS.

*Dewsbury.*—A new church which has just been erected in Swindon-road, Dewsbury, by the Unitarians, has been formally opened for Divine worship. It is a stone structure of Early English architecture, erected from designs by Mr. Crawford, of Leeds, at a cost of 1,500*l.*, the whole of which sum has been raised by public subscription.

*Bolton.*—The foundation-stone of a new Independent Chapel has been laid by Sir James Watts, at Edgworth, near Bolton. The chapel, which will be Gothic in style, is expected to cost 1,600*l.* or 1,700*l.*

*Droylsden.* — The foundation-stone of a new chapel in connexion with the Wesleyan Methodists has been laid at Droylsden. Since 1826, when the building in Market-street, now used both as chapel and schools, was opened, the population has largely increased, and it was determined to build a new chapel close by the old one, the latter to be thereafter set apart for the schools. A site was purchased from Mr. Christie, of Droylsden, in close proximity to the present chapel, and plans were obtained from Mr. J. W. Best, of Bolton, for a chapel which will accommodate about 630, one-third free. The cost is estimated at 2,400*l.* The building will be in the Italian style, and of brick with stone dressings. It will face the Manchester and Ashton road, at the point where it intersects Market-street. There will be a gallery round the chapel, which will be lighted by means of sunlights. The ceiling will be relieved with a moulded cornice. The gallery front will be formed of moulded panels, divided into bays by carved pilasters, and the gallery itself will be supported by columns with Corinthian capitals. The contractors for the work are Messrs. Bates & Baguley, of Droylesden.

*Folkestone.*—A Wesleyan chapel has been built here, from the designs of Mr. Joseph Gardener, at a cost of a little over 4,000*l.*, and is calculated to accommodate 900 persons. It has been formally opened.

*Thorncliffe (Sheffield).*—The new Wesleyan chapel at Thorncliffe has been opened for divine worship. The chapel is built on the site of the old one, on Mount Pleasant. The architecture is Early French Decorated, and the building consists of a tower, about 80 ft. high, a nave, two transepts, and an apse. There is a gallery in each of the transepts, and also one beneath the tower. The roof, which is of stained deal, is cored, ribbed, and bordered. The chapel is capable of accommodating about 600 persons, the sittings being open benches, of stained and varnished deal. The pulpit and reading-desk are of the same material. The building is heated by a hot-water apparatus, and it is lighted by two star-lights suspended from the ceilings and by several side lights. The architects are Messrs. Wilson & Wilcox, of London and Bath, and the builder is Mr. Robinson, of Barnsley. The total cost of the chapel is about 4,000*l.*, of which sum 3,000*l.* have been raised.

## STAINED GLASS.

*St. Mary's, Tetbury.*—A memorial window has been placed in this church, by Mr. James Alexander, of Doncaster, in memory of his deceased wife. The artists were Messrs. Wailes, of Newcastle. The cost is about 200*l.*

*St. Peter's School Chapel, York.*—Two stained-glass windows have been erected at the east end of this chapel—one in memory of the Rev. John Lees, formerly mathematical master of this school, the other as a mark of respect to the Rev. Canon Hey, for many years head-master. The latter window represents the burial of our Saviour. In one compartment are the figures of John and Peter carrying the body to the sepulchre, and in the immediately adjoining section are representations of three women watching the event. In the lower compartments are the sealing of the sepulchre, and the soldiers watching it. Over the canopy is the emblematic representation of the pelican feeding its young. At the base is the inscription. The memorial of the Rev. John Lees is a continuation of the same subject. The chief compartments portray the three Marys arriving at the tomb, and the Angel seated, exclaiming, "He is not here, He is risen." Beneath are incidents which occurred after the Resurrection, including the appearance of our Lord to Mary Magdalene in the garden, and the unbelieving Thomas thrusting his hand into the side of our Lord. Over the canopy is the figure of the Lamb, symbolic of the Saviour, and at the base the inscription. Both windows came from the establishment of Messrs. Clayton & Bell, of London, and they have been erected by Mr. R. Powell.

*St. Matthew's, Ipswich.*—A stained-glass window, in memory of the late Mr. James Jeffries, has been placed in the south chancel aisle of this church, by Mrs. Jeffries. The subjects are the "Six Acts of Mercy," one of which fills each of the six compartments. The work was executed by Messrs. Heatley & Butler, of London.

*Saffron Walden Church.*—An east window has been placed in the chancel of this church by the vicar's churchwarden, Mr. Joseph Lecand Taylor. The artists were Messrs. Ward & Hughes, of London. It is a five-light transomed window of the Perpendicular period, containing in the lower series of compartments, each under a light architectural canopy, and supported by an ornamental base, the following subjects, viz.—"The Nativity of our Saviour and Adoration of the Magi," "Our Lord's Baptism," "The Crucifixion," "The Last Supper," and "The Angel and the Marys at the Sepulchre." The next five lights above are wholly occupied with the subject of our Lord's Ascension. Next above, the tracery openings contain a choir of angels with harps and palm branches. Below is an inscription (in the glass) "To the Memory of Eliza Taylor, died January 5, 1865." The stone work was quite new when the church was much restored in 1860, and is a copy of the old and original stone frame which had been plastered over for seventy years, and which came to light during the alterations, when the old altar-piece was taken down.

*Sidmouth Church.*—The subjects depicted in the window about to be presented by her Majesty to this church in memory of H.R.H. the late Duke of Kent, are as follow: In the upper compartment is represented our Lord in glory, seated with orb and sceptre in his hand, surrounded by angels. Below are four angels holding crowns and palm branches. In the centre compartment is represented our Lord blessing little children. On each side of this are designs representing Christian charity, viz., feeding the hungry, giving drink to the thirsty, clothing the

naked, visiting the sick, hospitality to the stranger, visiting the prisoner; together with two others suggestive of benevolent institutions, viz., the care of orphans and religious education. Below are five of the acts of St. Nicholas;—the relief and endowment of three young women; the calming of a tempest; the consecration of St. Nicholas; sailors discharging a cargo of corn, increased by St. Nicholas in return for some taken for charity; and St. Nicholas staying the hand of the executioner.

## Books Received.

*A Descriptive Treatise on Mathematical Drawing Instruments, their Construction, Uses, &c., and Suggestions for Improvement; with Hints upon Drawing, Colouring, and Drawing Material.* By Wm. F. Stanley. Published by the author, at 5, Great Turnstile, Holborn, London.

We have been often asked for descriptions of various mathematical instruments, and cannot do better than refer students to this work. It is a practical and reliable treatise by the mathematical instrument maker to the Government, in various departments, and contains a clear and sufficient description of all the drawing instruments in general use; also the best instruments to be employed for producing every description of geometrical form, as the ellipse, helix, parabola, conchoid, arcs of high radii, geometrical ornaments, &c., with many important and popular instruments not yet adequately described in print, such as the ediograph, centrolinead, computing scale, geometrical pen, &c. The work is serviceably bound in cloth, and illustrated by over 200 engravings specially prepared.

The information given is no mere paste-and-scissors work, but freshly written from personal knowledge, and therefore especially valuable, and there was great need of such a work. We have here illustrated descriptions of the conchoidograph, the ediograph, the centrolinead, the computing scale, and many others, as well as of the better known and more simple instruments in use. As a specimen of the work, though without the advantage of the illustration, we may here give Mr. Stanley's description of his own conchoidograph:—

"It is a drawing instrument constructed by the author, to produce the conchoid of Nicomedes. It is intended to be used to describe columns and pilasters, with and without flutes, upon architectural drawings. It may also be used to strike the wave-line, the semi-ellipse, and for some other purposes.

The principle of the instrument is illustrated in Nicholson's 'Five Orders of Architecture,' in which, speaking of diminishing columns, he says:—'The best and most simple manner is by means of an instrument, invented by Nicomedes, to describe the first conchoid, for this being applied to the bottom of the shaft, performs at one sweep both the swelling and the diminution, giving such a graceful form to the column that it is universally allowed to be the most perfect practice hitherto discovered. The columns in the Pantheon at Rome, accounted among the most beautiful among the antique, are traced in this manner.

The instrument that is then described by Nicholson is adapted to give the workman the true form of the full-size column upon the stone, for which a small portion only of the conchoid is required. This instrument could not be reduced to a drawing instrument without a different construction, from its very limited action, particularly from its being adapted to work to one hand only, and from the want of any system of adjustment. Nevertheless, the principle of action is so correct that it only required a little study of constructive detail to render it an efficient drawing instrument.

The writer's conchoidograph consists of one straight metal rule, to the centre of which another similar rule is jointed at right angles. Each of the rules has an undercut groove along it, and a metal slide that moves easily in the groove. The slide in the rule, which is shown in horizontal position upon the engraving, has a screw, which will clamp it to the groove where required. Above the slides, and centred upon them, are two heads, similar to beam-compass heads; these are made so as to allow a light bar to slide through them, which may be clamped to either head by a screw above. At the end of the bar is a socket to carry ink or pencil point. The instrument is supported a short distance from the drawing upon four legs; two of these are placed in a line through the centre of the instrument, so that by causing them to touch the edge of a tee-square, the instrument is set at once in a vertical position.

*To use the Conchoidograph for delineating columns;* it is necessary, first, to set out the vertical centre line of the column, and from the centre line to set off the semi-diameters of top and bottom. The tee-square is then brought up to a line with the bottom of the column, and the instrument placed upon it, so that the two centre legs are brought against the upper edge of the tee-square, and the now vertical edge of the instrument is against the centre line of the column. The three screws attached to the sliding heads are released, so that all parts of the instrument are quite free. The slides and bar are brought into a line with the bottom of the column, and the pen or pencil point placed over the mark which indicates the semi-diameter; in this position the sliding head nearest the pen is clamped to the bar. The pen or pencil is then brought up to the top semi-diameter, and the other slide moved backwards until the pen or pencil will fall upon the required setting. In this position the back slide is to be clamped to the *sliding groove*, so that the head remains *stationary*, and the bar slides through it. It is now set, and the line may be delineated.

*To draw the corresponding side of the column;* the instrument is turned over on the tee-square to the reverse hand, without further setting.

This explanation may appear long, but by carefully going over it once, the instrument may be set in two minutes for any column. The necessity for drawing the centre and top and bottom semi-diameter, of course regards the first setting of the instrument only, and may be done on a separate piece of paper if required; as the instrument once set answers for all the columns and pilasters on the same drawing, the separate setting out of either the base or the cap will be sufficient.

The instrument may also be made to draw all the flutes of the column afterwards, perfectly and with little difficulty."

## VARIORUM.

"Scientific Opinion: Office, 11, Southampton-street, Strand." This new weekly journal is based on an excellent idea, analogous to that of *Public Opinion*. The contents are not merely compilation, but are interspersed with original matter on the scientific questions of the day. The editor, we believe, is Professor Lawson, who is also the editor of the very successful and popular *Science Review*. —— "The Breath of Life and the Breath of Death; and a People without a Country. Hardwicke, Piccadilly." This tractate relates to the important subject of open spaces around London, requisite both for fresh air to the metropolis and for recreation to the citizens. It is full time the Londoners were aroused by such exhortations as these to the peril they now stand in of being shut up altogether from the open fields in their enervating prison of brick.——"Gas Works: the Necessity for Removing them from the Metropolis, as at Paris. By Thomas B. Simpson. Freeman, 102, Fleet-street." This is a subject closely connected with the preceding. Since there is neither necessity nor advantage to the public in having the defiling and pernicious agency of gas manufacture going on within the limits of the metropolis and contaminating its atmosphere, the Legislature ought to be urged to compel gas companies to be off with their foul works to a safe distance. Even as it is, we have gas companies preferring to supply districts at a distance from their works rather than those at hand. Thus the Imperial Gas Company, whose works are at Fulham, do not supply that district, which is supplied from the Nine Elms Gas Works by the London Gas Company, while the Imperial actually supply Hampstead and Holloway! Their own practice, therefore, proves that there is no necessity for gas-works being located within the limits of the metropolitan population at all. The purpose of the pamphlet under notice is to draw attention to this important subject, at a very fitting time. ——"Report of the Sub-Committee (of the Social Science Association) on the Patent Law. London: 1, Adam-street, Adelphi." This report gives the results of a general consideration of the advisability of patenting inventions and the best mode of doing so. The interest of the public rather than of inventors has been the ruling principle kept in view by the reporters, who think that a patent law *is* expedient.

## Miscellanea.

The Sheffield Main Drainage Scheme.—The borough surveyor, Mr. Samuel F. Holmes, has laid before the highway committee a report on the drainage of the town, together with plans, sections, specifications, and estimates of the cost of the several intercepting drains required to carry beyond the limits of the borough the whole of the sewage at present flowing into the rivers Sheaf, Porter, Rivelin, and Don. The natural fall of the drainage areas of the borough, he states, is into the rivers Sheaf and Porter on the south and south-west, and into the Rivelin and Don on the north and east. The present report does not embrace the mode of dealing with the sewage when so intercepted and carried to Blackburn Forge, nor does the estimate include the cost of perfecting the street drainage of those portions of the town at present imperfectly drained. The reporter states, however, that, when the proposed intercepting drains are completed, there will remain no engineering difficulty to contend with. By the adoption of additional storm outlets the proposed drains, he considered, would be of sufficient capacity to carry away the sewage from a population of 400,000. The schedule of the proposed drains gives the total estimated cost at 41,411*l.*

The New Atlantic Telegraph.—The preparations on board the *Great Eastern* for receiving the telegraph have been completed, and the work of stowing away the cable in tanks prepared for its reception has commenced. At the end of June, or beginning of July, according to present arrangements, the *Great Eastern* will again commence laying the cable.

Cambridge.—Great exertion is being made in pulling down and clearing away a large number of houses opposite Trinity College, for the enlargement of the hostel. The work was commenced some years back by the late Master of Trinity. Mr. Selwyn is the architect, and Messrs. George Smith & Co., are the contractors. Casterton stone is to be used.

French Prize for Electric Light and Heat.—The *Moniteur* contains a decree by which a prize of 50,000f. is allotted, within the next five years, to the person who will discover a system by which the voltaic battery can be applied with economy to heating or lighting purposes, to the advancement of chemistry, manufactures, machines, or medical science.

Cement for Submarine Works.—At a recent meeting of the French Academy, a paper by M. Poirel, "On the Different Kinds of Cement which are used in the Fabrication of Artificial Blocks for the Foundation of Submarine Works," was read. M. Poirel stated that the only cement which can effectually resist the disintegrating effects of salt-water is that made of the *pozzolano* of Rome.

Society of Engineers.—At the last meeting of this society, Mr. Zerah Colburn, president, in the chair, the following gentlemen were duly elected. As members: Mr. Thomas Cargill, of Clapham; Mr. Haines Rowell, of Lee; Mr. E. S. Cathells, of Shrewsbury; Mr. James Blackburn, of Droylesden, near Manchester; and Mr. R. W. Carter, of Everton, Liverpool. As an Associate: Mr. Frank Livesay, of Dulwich. A paper, "On the Utilisation of Sewage," by Mr. Baldwin Latham, C.E., was read and discussed.

Value of a House in Piccadilly.—The family residence of the late Right Hon. Lord Willoughby d'Eresby, situated No. 142, Piccadilly, between Hamilton-place and Hyde Park, commanding views of the Green Park and Constitution-hill, with stabling in Hamilton-mews, held on lease from the Crown for a present term of forty years, at a low ground-rent, was disposed of at the mansion, by Mr. Phillips, of New Bond-street, by order of the trustees, for the large sum of 24,700*l.*, the tenant's fixtures to be taken by the purchaser of the lease; these fetched 550*l.* in addition—total, 25,250*l.* The frontage is under 30 ft.

Steel for Columns.—In France a few experiments were made some time ago by M. G. H. Love, upon small pillars made of Turton's steel, and having rounded ends. These pillars were one centimètre or 0·39 in. in diameter, the lengths being ten, twenty, and thirty times the diameter. The steel of which the pillars were composed was found by experiment to have a tensile breaking strength of 108,500 lb. per square inch. According to *Engineering*, the results show that, as in the case of cast and wrought iron, the resisting power of steel to compression decreases as the proportion which the length of the column bears to the diameter is increased; but this decrease in strength does not seem to be so rapid as in the case of the two first-mentioned materials. M. Love's own deductions are, that steel and cast-iron columns, having a length of from one and a half to five diameters, offer about the same resistance to compression; whilst columns of wrought iron of the same proportions offer only about half such resistance. When the length of the column is increased to ten diameters, however, he considers that steel offers a greater resistance than cast-iron, in the proportion of 41 to 31, the proportionate resistance of wrought iron being represented by 17. As the proportion of length to diameter increases, the resisting power of cast iron diminishes more rapidly than that of wrought iron, and that of wrought iron more quickly than that of steel, so that when the length reaches forty diameters, he estimates the strength of similar columns of the three materials to be in the proportion of the numbers 375, 562, and 1,500. It is wrong to found a law upon so few experiments; but, if the data above given are confirmed by future trials, steel will prove a valuable material for resisting compressive strains.

FALL OF A TEMPORARY GRAND STAND AT CHELTENHAM STEEPLECHASES.—The centre of a temporary stand, erected by a Gloucester tradesman, collapsed during the races at Cheltenham, and nearly 400 persons, chiefly men, who were on it, fell among the *débris* and on each other. Nine were seriously, and many more greatly injured by the fall. The construction is said to have been bad. No screws were used, only nails.

NEW IRON CHURCH FOR DEMERARA.—This is building in Glasgow, by Messrs. Thomas Edington & Son, from the designs of Mr. Honeyman, architect. The details are in the Gothic style of architecture. The nave consists of three aisles, the centre aisle having a clerestory. The length of the nave inside is 105 ft., and its width 70 ft., and the chancel is 35 ft. square. The height of the nave to ridge of centre aisle is 58 ft., and the height of chancel 48 ft. The roofs will be of dressed timber, except the principal couples, which are of iron. The nave has a hammer-beam roof, with angels carved on the ends of the hammer-beams, and richly filled-in spandrels of cast-iron above and below. The spandrels, forming arcading under clerestory walls, are filled in with Gothic scroll-work, and all the pillars have foliated capitals. The couples of the chancel spring from coupled twisted shafts, and the ridge will have an ornamental cresting. It should be added that the walls will be of brick, and that the design embraces a steeple 150 ft. high, constructed almost entirely of iron.

PADDLES AND SCREWS SUPERSEDED: THE HYDRAULIC PROPELLER.—A successful trial trip has been made with the *Nautilus*, a steam-vessel fitted with "the hydraulic propeller." The new motive apparatus differs greatly from paddles or screw-propellers. The engine and boiler are the same, but the steam power is applied through a wheel inside the vessel. This wheel takes up water (which is admitted into the metal case containing it, from the sea, by holes in the bottom of the vessel), and drives it out again with great force through two nozzles, one on each side of the vessel, above the water-line. The power thus exercised is said to be similar to the recoil produced by firing guns. The advantages claimed for this new propeller are, greater power at a less cost of fuel, the absence of vibration, and more efficient control in rough weather. In fact, the vessel, it is said, can be turned any way without a rudder, and may be stopped in half her length. Her average speed is 11½ miles an hour. The Admiralty have now in course of construction a gunboat, the *Waterwitch*, upon the same principle as the *Nautilus*. The inventor is Mr. Ruthven, of Edinburgh, who has till now been labouring in vain, since 1839, to get his invention into notice in this country, although a vessel on his principle has been constantly at work in Prussian waters ever since 1853.

THE VITAL AND OTHER STATISTICS OF GLASGOW FOR 1865. — Mr. West Watson, the City Chamberlain of Glasgow, has prepared the first part of his annual report on the vital, social, and economic statistics of the city. It deals with the mortality during the year; with births, marriages, and the increase of the population; with dwelling-houses and rental; and with the number and distribution of the present electoral body. "The mortality of 1865 within the municipal boundaries," says the report, "has amounted to 13,912; and if we estimate the population within the same boundaries as 430,000 at midsummer, it follows that the death-rate has been 32·353 in 1,000, or 3·235 per cent.; or, in other words, that one in 30·90, or say, in 31 of the population of Glasgow, has died during the year,—a high death-rate no doubt, but one which seems likely to be mitigated in the present year, if the results, as far as they have yet gone, may be accepted as a criterion. If the Registrar-General of England is correct in his position that the necessary or unavoidable mortality in a healthy community ought not to exceed 17 in 1,000, we seem to have a considerable amount of improvement to get through before we arrive at his standard of excellence." Of the 3,285 deaths from 1 up to 5 years of age, 1,747 occurred from 1 to 2 years; thus making the total mortality under 2 years of age 4,913, which is 35·315 per cent., or somewhat more than one-third of the total mortality. Nevertheless, the infantile mortality of Glasgow is lower now than it was eighty years ago. Of the total deaths, an average of 1 in 9¼ arose from typhus, and 1 in 580 from smallpox, chiefly infantile.

ARCHITECTURAL MUSEUM LECTURES.—As a long interval has occurred, it may be useful to remind our readers that the next lecture of this course,—"Existing Obstacles to the Progress of Gothic Architecture in England," by Mr. F. S. Powell, M.P., will be delivered at the Museum in Jermyn-street, St. James's, on Wednesday next, the 25th.

IMPROVEMENT COMMITTEE.—The following are the members forming the parliamentary select committee on the Thames Embankment (North) Approaches Bill, the Thames Embankment (Chelsea) Bill, and the Park-lane Improvement Bill:—Mr. William Cowper, Mr. Tite, Lord Henry Lennox, Mr. Beresford Hope, Mr. Hughes, and Mr. Baillie Cochrane.

FEVER IN MANCHESTER AND SALFORD: THE MANCHESTER AND SALFORD SANITARY ASSOCIATION.—At the annual meeting of the supporters of this association, Dr. Morgan read a voluminous report, from which we take the following abstract:—The returns of the association showed that the total number of new cases of continued fever last year was 3,788, and that of the patients 350 died, or 1 in every 10·8. In each of the four quarters of the year, there was a steady and continuous rise in the number of seizures. From the returns of the registrars it appeared that the loss occasioned by death from this cause in the eleven districts of the sanitary association—districts containing in the aggregate an estimated population of 429,478—amounted to 911. On the assumption that each of these deaths represented eleven cases of sickness, it would appear that in the course of the year 1865, no fewer than about 10,000 persons experienced attacks of continued fever. The money expended on these fever patients was not less than 30,000*l.*, and of the persons who died upwards of 60 per cent. were in the prime of life. Inquiry showed that in the most notorious fever districts of Manchester and Salford, the characteristics of the poorer dwellings were a complete absence of ventilation, and overcrowding. The impurity of the outer air, and the small proportion of oxygen which it contained were also to be considered, as well as the frequently imperfect way in which the surface drainage was provided for. Many of the houses it was impossible to purify or disinfect.

THE POLLUTION OF THE THAMES.—The first report of the commissioners appointed to inquire into the best means of preventing the pollution of rivers, commencing with the Thames, has been issued. The commissioners have made a personal inspection of the Thames, and have visited and made public inquiry in Oxford, Reading, Windsor, Kingston, Richmond, Lechlade, Great Marlow, Worthing, Croydon, and South Norwood. Among their main conclusions are the following:—That the navigation works on the upper Thames are in a neglected and ruinous condition, and that some of the weirs and locks are dangerous;—that sewage from towns, villages, and houses on the bank of the river pollutes the water;—that the river is fouled by refuse from paper-mills and tanneries, as also by floating carcasses of animals;—that there are many shoals and some mud-banks in the river consequent on the incompetence of the Thames Commissioners to maintain it in a navigable and proper state;—and that town and house sewage may be so utilized on land as to prevent the river from the danger of pollution. The commissioners also submit various recommendations, amongst which are the following:—That the whole river be placed under the superintendence of one governing body. That this body be the existing Conservancy Board, provided that the Board receive an addition of an adequate number of representatives of the local interests of the upper Thames;—that after the lapse of a period to be allowed for the alteration of existing arrangements, it be made unlawful for any sewage, unless the same has been passed over land so as to become purified, or for any injurious refuse from paper-mills, tanneries, and other works, to be cast into the Thames between Cricklade and the commencement of the metropolitan sewerage system;—that the conservators be empowered to levy upon all waterworks taking water for domestic or trade purposes from the River Thames, a rental in proportion to the volume abstracted; and that powers be given to the conservators to make embankments throughout the valley of the Thames, and carry out arterial drainage operations, the cost of such improvements to be met by a tax upon the properties so improved.

RATE OF MORTALITY.—The annual rate of mortality last week was 26 per 1,000 in London, 31 in Edinburgh, and 35 in Dublin; 31 in Bristol, 27 in Birmingham, 40 in Liverpool, 38 in Manchester, 35 in Salford, 30 in Sheffield, 31 in Leeds, 29 in Hull, 36 in Newcastle-upon-Tyne, and 39 in Glasgow.

THE ROYAL ACADEMY. — In reply to Mr. Gregory, Mr. Cowper said (in the House of Commons) he had received a letter from the President of the Royal Academy stating that the Academy had determined to make the alterations in its constitution which were thought expedient by the Government, and he should be prepared to lay the communication on the table.

THE COAL DUTIES.—The committee on the Local Government and Taxation of the Metropolis, at the close of their sitting on Friday last, passed a resolution recommending the House of Commons to continue the coal duties in their present form, for the completion of the Thames Embankment and other improvements instituted by the Board of Works, and likewise the improvement of Holborn Valley and Newgate-street, recommended by the Corporation.

PROPOSED ENLARGEMENT OF THE SUSSEX COUNTY LUNATIC ASYLUM.—The Court of Quarter Sessions (held at Lewes) have ordered the preparation of plans and estimates for the enlargement of the asylum at Hayward's Heath. The proposal, the carrying out of which is estimated to cost 9,200*l.*, is to include semi-detached buildings, for the reception of infectious and contagious diseases. By this enlargement it is calculated that additional accommodation will be afforded for 130 patients.

SANITARY INSPECTION IN ST. PANCRAS.—The vestry of St. Pancras having appointed two additional inspectors to make a house-to-house visitation in localities requiring sanitary improvement, Dr. Hillier, the medical officer of health, has reported the results of their first week's work, which he states are such as to convince any one previously sceptical of the need of such a measure. Mr. Boreham has been examining the streets and courts near Cromer-street, Gray's-inn-road, which were found very defective in sanitary arrangements. Who doubted it?

## TENDERS

For the erection of new warehouses in Southwark-street, for Mr. W. V. Wright. Messrs. Wimble & Taylor, architects:—

| | |
|---|---|
| Adamson & Sons | £11,478 0 0 |
| Little | 11,221 0 0 |
| Downs | 11,182 0 0 |
| Marsland | 10,580 0 0 |
| Colls & Sons | 10,449 0 0 |
| Hart | 10,420 0 0 |
| Ramsay | 10,336 0 0 |
| Hill & Son | 10,279 0 0 |
| Newman & Mann | 10,228 0 0 |

For building five houses and shops, and a tavern, in Conduit-street, Paddington, for the Metropolitan Railway Company. Mr. A. Evers, architect. Quantities by Messrs. Pain & Clark:—

| | | Add for shop fronts. | Deduct for malms instead of red bricks. |
|---|---|---|---|
| Langridge | £19,900 | 350 | 30 |
| Patrick & Son | 16,490 | 249 | 20 |
| Carter & Son | 16,360 | 165 | 13 |
| Gammon | 16,198 | 281 | 52 |
| Foster | 15,980 | 145 | 16 |
| Piper & Wheeler | 15,730 | 176 | — |
| Sawyer | 15,552 | 240 | — |
| Webb & Son | 15,194 | 210 | — |
| Ebbs & Sons | 14,900 | 250 | 13 |

For a mansion and stable buildings, for Mr. A. Barton, at Longmead, Bishopstoke, Hants. Mr. G. E. Street, architect:—

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|---|---|
| Nicholson & Son | £13,704 0 0 |
| Wall & Hook | 13,570 0 0 |
| Myers & Sons | 13,460 0 0 |
| Bull & Son | 12,760 0 0 |
| Dove, Brothers | 12,640 0 0 |
| Futcher | 11,991 0 0 |
| Sawyer | 11,785 0 0 |
| Rodger & Booth | 11,350 0 0 |

For the erection of a public-house in the Wells-road, Sydenham. Mr. Nicholas Lake, architect:—

| | |
|---|---|
| Cheer | £1,619 0 0 |
| Kent | 1,553 0 0 |
| Barrett | 1,547 0 0 |
| Wood & Munn | 1,408 0 0 |
| Wills | 1,393 0 0 |

For the erection of a dwelling-house in Neat-street, Camberwell. Mr. Nicholas Lake, architect:—

| | |
|---|---|
| Wood & Munn | £810 0 0 |
| Wills | 799 0 0 |
| Thompson | 743 0 0 |
| Sharp | 697 10 0 |